Rennsport Properties LLC

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July 2024

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Focused Initial Study
206 Single-Family Homes
Silver Beach Grand San Jacinto

Initial Study
206 Single-Family Homes
Silver Beach Grand San Jacinto

Prepared for:

Rennsport Properties LLC
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Huntington Beach, CA 92646

July 31, 2024

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List of Acronyms and Abbreviations

AB	Assembly Bill
ADWF	Average Dry Weather Flow
AFY	Acre-Feet per Year
APN	Assessor's Parcel Number
AQMP	Air Quality Management Plan
ARMR	Archaeological Resource Management Reports
BAAQMD	Bay Area Air Quality Management District
BMP	Best Management Practice
Btu	British Thermal Unit
Cal/OSHA	California Division of Occupational Safety and Health
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CAPCOA	California Air Pollution Control Officers Association
CBC	California Building Code
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	Methane
CHL	California Historical Landmarks
CNEL	Community Noise Equivalent Level
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CPHI	California Points of Historical Interest
CRHR	California Register of Historical Resources
CWA	Clean Water Act
dB	Decibel
dBA	A-Weighted Decibel
DPM	Diesel Particulate Matter
DTSC	[California] Department of Toxic Substances Control
DWR	[California] Department of Water Resources
EDU	Equivalent Dwelling Unit
EIC	Eastern Information Center
EIR	Environmental Impact Report
EMWD	Eastern Municipal Water District
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration

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GHG	Greenhouse Gas
HCM	Highway Capacity Manual
HHV	Higher Heating Value
HNL	Hourly Noise Level
HRI	Historical Resources Inventory
HVAC	Heating, Ventilation, and Air Conditioning
IS	Initial Study
kg	Kilogram
LDR	Low Density Residential
LED	Light-Emitting Diode
LID	Low Impact Development
LOMR	Letter of Map Revision
LOS	Level of Service
LST	Localized Significance Threshold
LTS	Less Than Significant Impact
LTSM	Less Than Significant Impact with Mitigation Incorporated
MDR	Medium Density Residential
MGD	Million Gallons per Day
MHDR	Medium-High Density Residential
MLD	Most Likely Descendant
MMcf	Million Cubic Feet
MND	Mitigated Negative Declaration
mph	Miles per Hour
MS4	Municipal Separate Storm Sewer System
MSHCP	Multiple Species Habitat Conservation Plan
MT	Metric Ton
MWh	Megawatt-Hours
N_2O	Nitrous Oxide
NAHC	Native American Heritage Commission
NI	No Impact
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
PCP	Prestressed Concrete Pipe
PM_{10}	Respirable Particulate Matter
$PM_{2.5}$	Fine Particulate Matter
PPV	Peak Particle Velocity
PRC	[California] Public Resources Code
PS	Potentially Significant Impact

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PV	Photovoltaic
PVC	Polyvinyl Chloride
RCFD	Riverside County Fire Department
ROG	Reactive Organic Gas
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCS	Sustainable Communities Strategy
SGMA	Sustainable Groundwater Management Act
SJUSD	San Jacinto Unified School District
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_x	Oxides of Sulfur
SPDR	Site Plan and Design Review
SRA	Source-Receptor Area
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminant
TAZ	Traffic analysis Zone
TCR	Tribal Cultural Resource
TMDL	Total Maximum Daily Load
TPA	Transit Priority Area
U.S. DOA	United States Department of Agriculture
U.S. DOT	United States Department of Transportation
U.S. EPA	United States Environmental Protection Agency
U.S. FWS	United States Fish and Wildlife Service
UWMP	Urban Water Management Plan
VHDR	Very High Density Residential
VMT	Vehicle Miles Traveled
WEAP	Worker Environmental Awareness Program
WQMP	Water Quality Management Plan
WRCOG	Western Riverside Council of Governments

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Initial Study
206 Single-Family Homes
Silver Beach Grand San Jacinto

1.0 INTRODUCTION

1.1 Purpose of the Initial Study

This focused Initial Study (IS) has been prepared in accordance with the provisions of the California Environmental Quality Act (CEQA), as set forth in the California Public Resources Code (PRC) Sections 21000 to 21174. In accordance with the California Code of Regulations (CCR) Title 14 Section 15002(a) CEQA Guidelines, the basic purposes of CEQA are to inform public agency decisionmakers and the general public of the significant environmental effects of a project, identify possible ways to minimize the significant effects through the use of mitigation measures or alternatives to the project, and disclose to the public the reasons why a government agency approved the project if significant environmental effects are involved.

An IS for a project subject to CEQA is prepared to analyze the potential for significant impacts on the environment resulting from implementation of the proposed project (CEQA Guidelines Section 15063). This IS informs the City of San Jacinto decisionmakers, affected agencies, and the public of potentially significant environmental impacts associated with the implementation of the proposed Project, as defined in Section 15382. As such, this document's intent is to adhere to the following CEQA principles:

- Provide meaningful early evaluation of site planning constraints, service, and infrastructure requirements and other local and regional environmental considerations (PRC Section 21003.1);
- Encourage the applicant to incorporate environmental considerations into project conceptualization, design, and planning at the earliest feasible time [State CEQA Guidelines Section 15004(b)(3)]; and
- Specify mitigation measures for reasonably foreseeable significant environmental effects and commit the City of San Jacinto and the applicant to future measures containing performance standards to ensure their adequacy when detailed development plans and applications are submitted (State CEQA Guidelines Section 15126.4).

2.0 ENVIRONMENTAL SETTING

2.1 Project Location

The 37.87-acre project site is located near the intersection of North Ramona Boulevard and Ranch View Lane in the city of San Jacinto, CA. The site is identified by Assessor's Parcel Numbers (APNs) 436-040-006, 436-040-008, and 436-030-001. The vertical relief on-site ranges from 1,464ft ASL to 1,475ft ASL Figure 2-1 provides an overview of the project location and the Figure 2-2 show the project vicinity.

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Figure 2-1: Project site location



The Project site boundary is outlined in red and the city boundary is outlined in blue.

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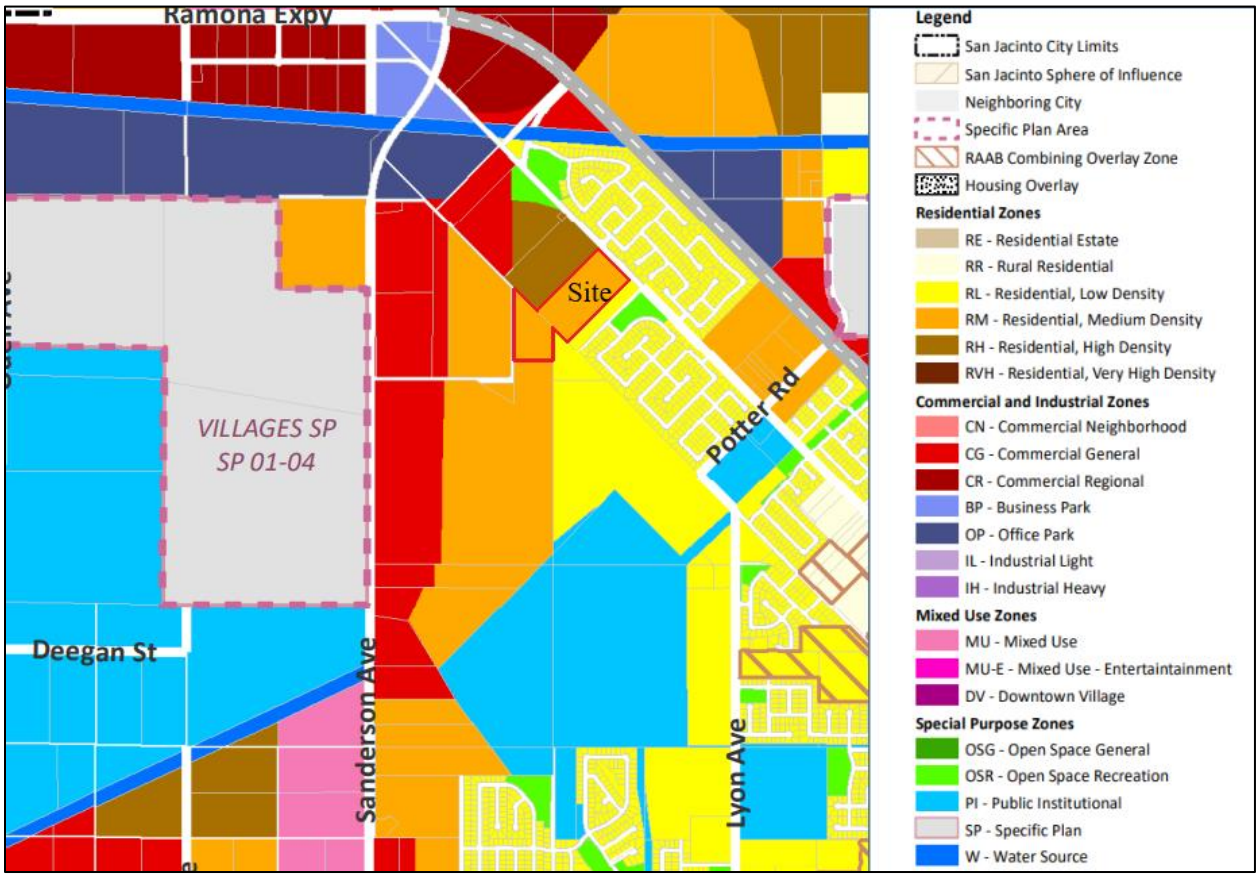
2.2 Existing Project Site

The Project site currently consists of three vacant parcels. At the time of investigation, the land was clear, but it seems it has been recently used for farming purposes. There was no structure, at the time of investigation it was vacant and undeveloped land. According to the topography, the land is mostly level and slopes gently downward towards the southwest.

2.3 Existing General Plan Land Uses and Zoning Designations

The General Plan designation for the Project site is Medium Density Residential (MDR) and Medium-High Density Residential (MHDR). The zoning is Residential Medium Density (RM) and Residential Low Density (RL). Therefore, this residential development is consistent with the General Plan and zoning requirements of the city.

Figure 2-2: Zoning Map



Source: City of San Jacinto Zoning Map:

https://static1.squarespace.com/static/5a999021cc8fedea12873268/t/639a2e04aeddc76df9d10478/1671048709061/SJC_ZoningMap_11x17_ADOPTED_221115.pdf

2.4 Surrounding General Plan and Zoning Designations

The General Plan Land Use Policy Map designates the land abutting the site to the northwest as Medium High Density Residential (MHDR) and Medium Density Residential (MDR), MDR to the south, and Low Density Residential (LDR) to the north and east. Within the vicinity of the

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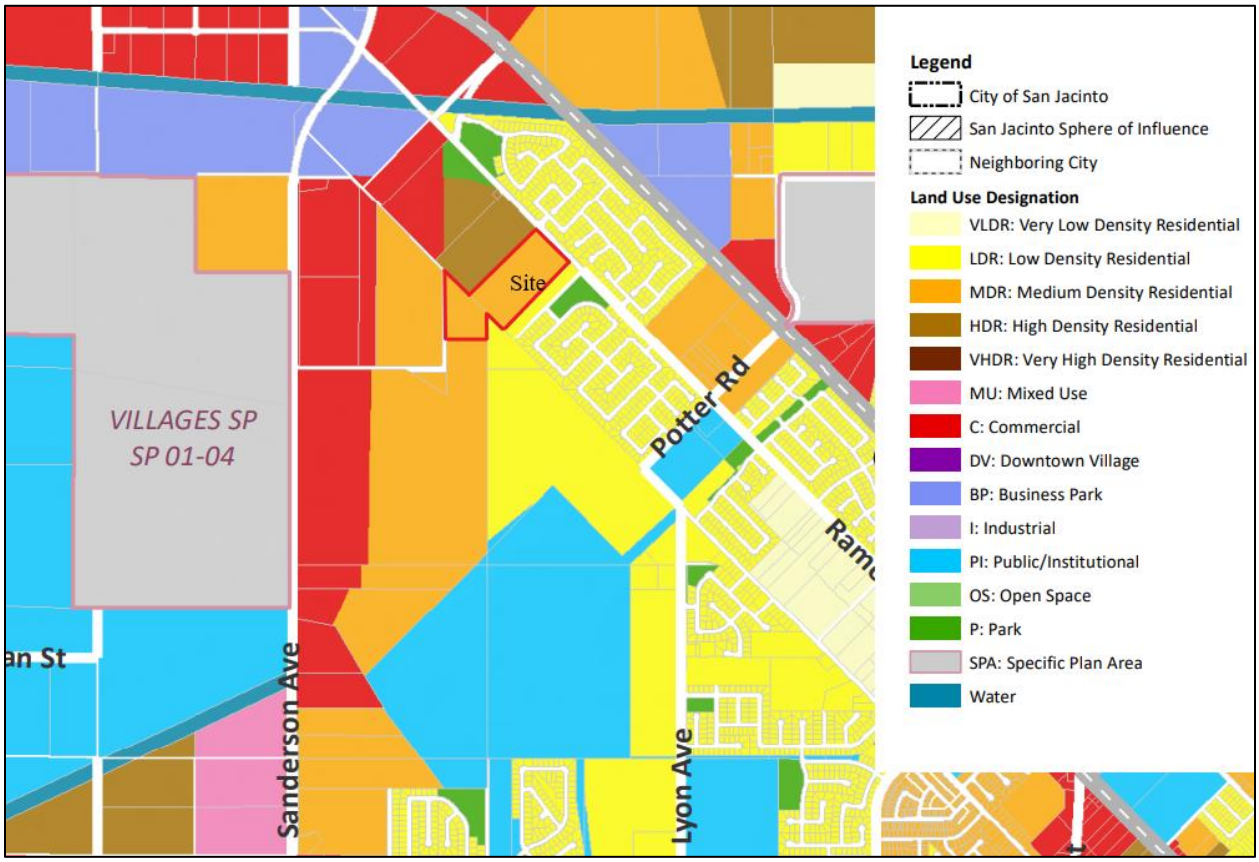
Project site, there is land designated for Industrial (I), Community Commercial (CC), Park (P), and Very High Density Residential (VHDR). On the North side of the project area, Col Lewis Millet Park is Located. On the South of the project site, the land is undeveloped. On the East side of the project area Potter Ranch Park is located. On the west side of the project site, undeveloped land is located.

Overall the project area is located in a less dense area. Only parks are located on 2 of the project sides and the remaining two sides are undeveloped. So the project won't have any major effect on humans as well as other living organisms because of the small size of the project and the low density of the population residing around the project area. N-Ramona Blvd to the North East and N Sanderson Avenue is located to the west of the project site.

Figure 2-3: Plan Land Use



Source: City of San Jacinto General Plan Land Use Map:
https://cdnsm5hosted.civiclive.com/UserFiles/Servers/Server_10384345/File/City%20Government/Community%20Development/Planning/General%20Plan%202040/San%20Jacinto_Adopted%20GPU.pdf

3.0 PROJECT DESCRIPTION

3.1 Project Features

The proposed Project is a 37.87-acre development with 206 single-family homes with 1 type of house plan of 1 story and 17ft in height and other 6 types of plans of 2 stories with an average height of 25ft to be located near the intersection of North Ramona Boulevard and Ranch View

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Lane in the city of San Jacinto, CA (the City). The three vacant parcels will be developed with homes, roads, sidewalks and utilities.

Circulation

Site access is provided on Ramona Boulevard by the proposed residential street temporarily named "A Street", which will be the main entrance to the project site. An exclusive eastbound right-turn pocket and an exclusive westbound left-turn pocket will be provided on Ramona Boulevard. This access will be controlled by a STOP sign posted on "A Street" along with corresponding pavement markings.

A secondary access point for the development will be provided on Sanderson Avenue at the proposed De Anza Drive, which provides one lane in each direction with a pavement width of 26 feet. The intersection of De Anza Drive and Sanderson Avenue will be controlled by traffic signals. Upon project completion, De Anza Drive will serve as a Collector for the subject community solely until future developments progress in the surrounding area.

Water and Wastewater requirements

The proposed Project will tie into an existing Eastern Municipal Water District (EMWD). The EMWD's "Will Serve" letter states the EMWD is willing to provide water service to the Project subject to its design requirements, permitting process, and fees.

Drainage / Hydrology / Water Quality

The proposed project will improve drainage by collecting in two separates on site storm drains systems and conveyed to two detention basins, Basin A and Basin B.

According to City of San Jacinto Ordinance Number 13.44, which establishes Urban Stormwater Runoff Management and discharge controls to improve Water Quality and comply with Federal/State Regulations and any subsequent amendments, revisions or ordinances pertaining there to. The proposed site design BMPs selected for this project have been approved in concept.

-Biofiltration basins,

-Self-treating landscape

The above will contribute the discharge of surface runoff without any substantial change in the rate or amount. Hydrology and Water Quality of this Initial Study for a more detailed discussion.

Landscaping

Landscape designs that are in accordance with the Country's or City's water conservation resolutions will be put into practice and may involve the installation of water sensors, the use of programmable irrigation schedules (for short cycles), etc.

Signage

The site will be marked with signs like "Do not dump hazardous materials here", and "Only washing is allowed in the washing area" will be posted. At public access sites along channels and streams within the project area, signs with prohibitive wording and/or graphical images that forbid unlawful dumping will be put up.

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3.2 Construction

The Project is expected to require up to approximately 44 months of planned work activities (i.e., from mobilization to substantial completion), as detailed in Table 3-1, comprising of five construction phases.

All proposed construction activities for the project will take place in daylight during regular business hours (i.e., weekdays from 7:00 a.m. to 6:00 p.m.).

Table 3-1: Anticipated 5-Day Construction Schedule

Construction Phase	Working Days
Site Preparation	30
Grading	75
Building Construction	740
Paving	55
Architectural Coating	55

3.3 Discretionary Approvals and Permits

Upon review of the Pre-Application for the Silver Beach Grand San Jacinto Project, as originally proposed by another developer prior to acquisition by Rennsport, the City of San Jacinto Development Review Committee requested the following required applications:

- Tentative Tract Map: Shall be prepared in accordance with Section 16.12.040 of the Municipal Code.
- City of San Jacinto Environmental Review Application.
- Site Plan and Design Review (SPDR): An SPDR application is required for all new residential development to provide a process for the appropriate review of development projects. The SPDR can be completed after approval of the Tentative Tract Map; however, a conceptual housing plan would be recommended.
- A Preliminary Water Quality Management Plan (WQMP): A WQMP is required for all new development or modifications to existing development projects.
- Conceptual Landscape Package: A conceptual landscape package in compliance with Site Planning and Development Standards, Article 3, 17.325.060[1] — Landscape and Irrigation Submittal Package Requirements shall be submitted before the issuance of a required building permit, grading permit, or another construction-related permit.
- Conceptual Architectural Plan.

3.4 Off-site impacts

Traffic and transportation: The increased population density resulting from a housing society leads to additional traffic congestion in the surrounding area. This requires infrastructure improvements, such as road expansions or the creation of new transportation routes, to accommodate the increased demand. Although the project is not big enough, still it will have offsite impact up to some extent.

Infrastructure strain: The construction of a housing society put additional strain on existing infrastructure, including water supply, sewage systems, and power distribution networks.

Source: [1.] Site Planning and Development Standards

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Social dynamics: The establishment of a housing society result in changes to the social fabric of the surrounding community. The influx of new residents leads to shifts in demographics, local culture, and community dynamics. These changes have both positive and negative impacts on the existing community.

Demand for public services: A housing society will increase the demand for public services, such as healthcare, education, and public safety. Local schools and hospital facilities will experience increased pressure to accommodate the growing population. Adequate planning and resource allocation are essential to ensure that these services can meet the needs of both existing and new residents.

Economic effects: The construction and operation of a housing society have economic impacts on the surrounding area. It generates job opportunities during the construction phase and potentially stimulate local businesses. However, it also led to increased competition for resources and services, which can affect local businesses and property values.

4.0 ENVIRONMENTAL CHECKLIST

The CEQA environmental checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. This checklist identifies and evaluates potential adverse environmental impacts that may be created by the proposed Project. No topical areas on the checklist were found to have mitigated impacts exceeding applicable thresholds of significance.

4.1 Environmental Factors Potentially Affected

The following environmental resource areas have been assessed to determine if the affection could be "Potentially Significant" "Less than Significant with Mitigation Measures Incorporated" or "Less than Significant" by the proposed Project.

As indicated by the checklists on the following pages, environmental topics marked with a "✓" require mitigation to avoid significant impacts. An explanation relative to the determination of impacts can be found following the checklist questions for each resource area.

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

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4.2 Determination

On the basis of this initial evaluation:

- ☐ I find the Proposed Project COULD NOT have a significant effect on the environment, and that a NEGATIVE DECLARATION has been prepared.
- ☑ I find that although the Proposed Project could have a significant effect on the environment, there will not be significant effects in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the Proposed Project MAY have a significant effect(s) on the environment, and an ENVIRONMENTAL IMPACT REPORT (EIR) is required.
- ☐ I find that the Proposed Project MAY have a "potentially significant impact" on the environment, but at least one effect: 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards; and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the Proposed Project could have a significant effect on the environment, because all potentially significant effects: 1) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards; and 2) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the Proposed Project, nothing further is required.

Signature: Steven A. Valdez **Date:** 8/7/2024

Steven Valdez
Principle Planner
City of San Jacinto

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4.3 Environmental Checklist and Discussion

This section provides a discussion of the potential environmental impacts of the proposed Project. The evaluation of environmental impacts follows the questions provided in the Appendix G Checklist.

For each question listed in the Appendix G checklist, a determination of the level of significance of the impact is provided. Impacts are assigned to one of the following categories:

- A designation of no impact (NI) is given when no adverse changes in the environment are expected;
- A less than significant impact (LTS) would cause no substantial adverse change in the environment;
- A less than significant impact with mitigation incorporated (LTSM) would have a substantial adverse impact on the environment but could be reduced to a less than significant level with incorporation of appropriate mitigation measure(s); and
- A potentially significant impact (PS) would cause a substantial adverse effect on the environment and no feasible mitigation measures are available to reduce the impact to a less than significant level.

A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency relied upon for the scoping analysis. A No Impact answer is adequately supported if the referenced information sources show that the impact simply does not apply to the project (e.g., the project falls outside a fault rupture zone). A No Impact answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

All answers must take account to the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

Once it is determined that a particular physical impact may occur, then the check list answers must indicate if the impact is potentially significant, less than significant with mitigation, or less than significant.

Explanation of each issue identifies:

- The significance criteria or threshold, if any, used to evaluate each question; and
- The mitigation measure identified, if any, to reduce the impact to less than significant.

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4.3.1 Aesthetics

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. Aesthetics. Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☑	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☑
c) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surrounddings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☑	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☑	☐

Environmental Determination:

a) Have a substantial adverse effect on a scenic vista?

Impact: Less than Significant Impact

A scenic vista refers to views of focal points or panoramic views (wide-angle view, all-encompassing vista that captures a broad expanse of a landscape or scene.) of broader geographic areas that have visual interest. A focal point view would consist of a view of a notable object, building, or setting. Diminishment of a scenic vista would occur if the bulk or design of a building or development contrasts enough with a visually interesting view, so that the quality of the view is permanently affected. The Project site has a flat topography and does not include any scenic vistas or other significant natural features in in the immediate vicinity.

The Lakeview Mountains are located approximately 2.5 miles west of the site and the San Jacinto Mountains are located approximately 2 miles north and northeast of the site. Long-

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distance background views of the San Gabriel Mountains, Santa Ana Mountains, Norco Hills, and Chino Hills can be seen from Project site. The Project site is located in a developing area bounded by existing residential developments to the north and east. These existing residential developments consist of one- and two-story single-family residences that partially obstruct views of the San Jacinto Mountains to the north and east when travelling northwest on North Ramona Boulevard. The surrounding mountains of the project sites are at different elevation ranging from 600 to 700 m height and the project site is at 452 m elevation based on the physical locations and height, the project site has no impact on the views of mountains as the elevation difference is too much.

Secondly the reservoir is also on flat surface with a difference of 5 m elevation from the project site and at a distance of 2.5 Km.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Impact: No Impact

There are no officially designated State scenic highways in the City. Therefore, there are no State scenic highways in the vicinity of the proposed Project. The California Department of Transportation (Caltrans) list of eligible and officially designated State Scenic Highways identifies that the closest eligible State Scenic Highway is State Route 74, which is located approximately 4.3 miles south of the Project site and is not visible from the Project site (Caltrans 2022). Therefore, no impacts related to scenic resources within a State scenic highway would occur.

c) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

Impact: Less than Significant Impact

The proposed Project is located in a rapidly developing area adjacent to existing residential development. The General Plan designation for the project site is MDR and MHDR. The zoning is RM and RL. Therefore, this residential development is consistent with the City's General Plan and Zoning requirements. The proposed development would be consistent with adjacent land use developments and would have a less than significant impact on the exiting visual character of the site.

According to the City's Zoning Map, the project is located in a high-density residential area. However, it is important to note that the adjacent properties are used for storage and agricultural purposes, creating a landscape that is not typical of an urban area. In this regard, the project has minimal impact on the scenic views, considering both the project's characteristics and the non-urban nature of the surroundings. This combination is expected to preserve the existing views without significant alterations, thereby maintaining the overall quality and appreciation of the landscape.

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d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Impact: Less than Significant Impact

The Project site is undeveloped and therefore does not have any existing sources of light or glare during the day or night. The adjacent residential development is the main source of light and glare in the area.

The proposed Project would include the provision of nighttime lighting for security purposes around all of the residences, which would contribute additional sources to the overall ambient nighttime lighting conditions. However, all outdoor lighting would be hooded, appropriately angled away from adjacent land uses, and in compliance with the City of San Jacinto Development Code Section 17.300.080, which provides specifications for shielding lighting away from adjacent uses and intensity of lighting (City 2012). Compliance with the City's lighting regulations would be verified by the City's Building and Safety Department during the permitting process, and the increase in light that would be generated by the proposed Project would not adversely affect day or night views in the area. Overall, lighting impacts would be less than significant.

Reflective light, or glare, can be caused by sunlight or artificial light reflecting off finished surfaces. Generally, darker or mirrored glass has a higher visible light reflectance than clear glass. Buildings constructed of highly reflective materials from which the sun reflects at a low angle can cause adverse glare. The proposed Project does not have substantial reflective surfaces or glass-sided buildings. Residences would contain windows separated by architectural elements, which would limit the potential for glare. In addition, on-site lighting would be angled down and shielded, which would avoid the potential to generate glare. Therefore, the proposed Project would not generate substantial sources of glare, and impacts would be less than significant.

Mitigation Measures:

None required.

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4.3.2 Agriculture and Forestry Resources

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
II. Agriculture and Forestry Resources. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?	☐	☐	☑	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☑
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☑
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☑
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☑	☐

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Environmental Determination:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

Impact: Less than Significant Impact

The Farmland Mapping and Monitoring Program identified the Project site as Farmland of Statewide Importance in 2018 (California Department of Conservation 2016). Thus, the proposed Project would convert Farmland of Statewide Importance to non-agricultural use. However, according to the City of San Jacinto 2013-2021 Housing Element, Appendix B – Residential Land Inventory, APNs 436-030-001 and 436-040-006 are designated Medium Density Residential (MDR) under the General Plan and zoned Residential Multiple (RM). APN436-040-008 is designated Low Density Residential (LDR) under the General Plan and zoned Residential Low Density (RL) (City 2018). The development of the proposed Project is in alignment with the City's General Plan and zoning; therefore, impacts would be less than significant.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

Impact: No Impact

- The proposed Project would not conflict with agricultural zoning or a Williamson Act contract. The Project site is currently zoned RM and RL. According to de City's General Plan Land Use Policy Map; The RM district is consistent with and implements the medium density residential (MDR) land use designation of the general plan. The Medium Density Residential land use designation allows for a range of housing types including single-family attached and detached units, condominiums, townhouses, and mobile home parks, as well as multiple-family dwellings such as apartments, and senior housing at a density of between 5 and 14 dwelling units per gross acre. The RL district is consistent with and implements the Low Density Residential (LDR) , its land use designation provides for the development of low density detached single-family dwellings at a density between 2 and 7 dwelling units per gross acre.

  As shown in the City's General Plan Land Use Policy Map, there are no agricultural zoned areas located within or in the vicinity of the Project site, and no parcels in the Project vicinity have Williamson Act contracts. Therefore, implementation of the proposed Project would not conflict with existing zoning for agricultural use or a Williamson Act contract, and no impact would occur.

c) Conflict with existing zoning for, or cause rezoning of, forestland (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

Impact: No Impact

Since, the project site is currently zoned RM and RL. The proposed Project is not located within forest land, timberland, or timberland zoned Timberland Production. As a result, the proposed Project would not conflict with, or cause any alteration to, existing zoning for forest land, timberland, or timberland zoned Timberland Production. Project won't have

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any impact in the forest land due to any forest land, timberland or timberland zoned is located near or in the project site. This is apparent in "California's Forest Resources: Forest Inventory and Analysis, 2001-2010," where the site and the surrounding area are not forested or a forest plot (U.S. DOA 2016).

d) Result in the loss of forest land or conversion of forest land to non-forest use?

Impact: No Impact

The proposed Project is not within forest land, will not result in the loss of forest land, and will not convert forest land to non-forest use. "California's Forest Resources: Forest Inventory and Analysis, 2001-2010" shows that the site and surrounding area are not forested or a forest plot (U.S. DOA 2016). The level of impact of the proposed project is 0 due to any forest land will be convert into non-frets land due to any land is being used for these purposes.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

Impact: Less than Significant Impact

Although the Project site is designated Farmland of Statewide Importance on the California Department of Conservation Farmland Mapping and Monitoring Program, the Project site is no longer used for agricultural purposes (California Department of Conservation 2016). As stated in Part a) of this Section, the Project site is zoned for residential uses and is consistent with the General Plan.

The analysis conducted in the General Plan Environmental Impact Report (GP EIR), it can be concluded that the proposed conversion, which is not intended for agricultural activities and is designated for residential use, is not expected to have significant impacts on agricultural land availability or food production. The GP EIR has likely already assessed these potential impacts and determined that they are minimal or non-existent.

Furthermore, the GP EIR would have also examined the absence of forests in the area and concluded that the conversion would not alter or affect forest ecosystems, associated biodiversity, or the environmental services they provide.

Therefore, considering the findings of the GP EIR, it can be reasonably concluded that the proposed conversion will have no or negligible impacts on agriculture and forests.

Mitigation Measures:

None required.

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4.3.3 Air Quality

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
III. Air Quality. Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☑	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard?	☐	☐	☑	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☑	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☑	☐

Summary:

Estimated construction and operational impacts related to air quality are evaluated against quantitative criteria established by the South Coast Air Quality Management District (SCAQMD). These criteria are relied upon to make significance determinations based on mass emissions of criteria pollutants. As shown in Tables 4-1, 4-2, 4-3, and 4-4 below, the proposed Project would result in a less than significant impact related to regional emissions, which would not be cumulatively considerable. Further, the proposed Project would not conflict with SCAQMD planning goals, cause substantial air pollutant concentrations, or be a source of objectionable odors. Appendix A contains the October 13, 2021 Yorke technical report with details of the interrelated air quality Study.

Environmental Determination:

a) Conflict with or obstruct implementation of the applicable air quality plan?

Impact: Less Than Significant Impact

The Project site is located in the South Coast Air Basin (SCAB), comprising all of Orange County and the non-desert regions of Los Angeles, Riverside, and San Bernardino Counties. The South Coast Air Quality Management District (SCAQMD) is the agency primarily responsible for comprehensive air pollution control in the SCAB and reducing

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emissions from area and point stationary, mobile, and indirect sources. The SCAQMD prepared the 2016 Air Quality Management Plan (AQMP) to meet federal and State ambient air quality standards. The 2016 AQMP contains a comprehensive list of pollution control strategies directed at reducing emissions and achieving ambient air quality standards. These strategies are developed, in part, based on regional population, housing, and employment projections prepared by the Southern California Association of Governments (SCAG). SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties and addresses regional issues relating to transportation, the economy, community development, and the environment. With regard to future growth, SCAG has prepared the 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (2016-2040 RTP/SCS), which provides population, housing, and employment projections for cities under its jurisdiction. The growth projections in the 2016-2040 RTP/SCS are based in part on projections originating under County and City General Plans. These growth projections were utilized in the preparation of the air quality forecasts and consistency analysis included in the 2016 AQMP. The 2020-2045 RTP/SCS was approved in September 2020. Consistency with the 2020-2045 RTP/SCS is therefore analyzed in the Land Use, Greenhouse Gas, and Energy sections of this IS. However, the 2016 AQMP relies on the 2016-2040 RTP/SCS and is therefore addressed for consistency with the 2016 AQMP.

The 2016 AQMP was adopted by the SCAQMD as a program to lead the SCAB into compliance with several criteria pollutant standards and other federal requirements. It relies on emissions forecasts based on demographic and economic growth projections provided by SCAG's 2016-2040 RTP/SCS. SCAG is charged by California law to prepare and approve "the portions of each AQMP relating to demographic projections and integrated regional land use, housing, employment, and transportation programs, measures and strategies." Projects whose growth is included in the projections used in the formulation of the AQMP are considered to be consistent with the plan and not to interfere with its attainment. The SCAQMD recommends that, when determining whether a project is consistent with the current AQMP, a lead agency must assess whether the project would directly obstruct implementation of the plan and whether it is consistent with the demographic and economic assumptions (typically land use-related, such as resultant employment or residential units) upon which the plan is based (SCAQMD 2017).

A significant air quality impact may occur if a project is inconsistent with the AQMP or would in some way represent a substantial hindrance to employing the policies or obtaining the goals of that plan. The Project involves the construction of 206 single-family residences on vacant, undeveloped land. The Project site has a General Plan land use designation of MDR which allows from 8 to 20 units per acre and LDR allows 1 to 5 units per acre and the proposed density for the project is 5.4 units per acre, which is consistent with the density proposed by the Project. As such, the development density of this proposed Project would be consistent with the AQMP and would not conflict with or obstruct the implementation of applicable AQMPs. Further detail is discussed in Section 4.3.14 Population and Housing. Thus, the Project would not conflict with or obstruct implementation of the 2016 AQMP.

Furthermore, according to the Air Quality Study prepared by Yorke Engineering, LLC (Yorke) dated October 13, 2021, provided in Appendix A, the Project does not exceed the

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SCAQMD's established thresholds of potential significance for air quality impacts. Thus, the proposed Project is not expected to conflict with or obstruct the implementation of the AQMP and SCAQMD rules. Therefore, impacts would be less than significant, and no mitigation is required.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Impact: Less Than Significant Impact

In order to evaluate impacts, quantitative significance criteria established by the local air quality agency, such as the SCAQMD, may be relied upon to make significance determinations based on mass emissions of criteria pollutants.

A significant impact would occur if the proposed Project would violate any air quality standard or contribute substantially to an existing or projected air quality violation. Project construction and operation emissions are estimated using the California Emissions Estimator Model® (CalEEMod), the statewide land use emissions computer model designed to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operations from land use projects. According to the CalEEMod model results, as summarized in the Air Quality Study conducted by Yorke dated October 13, 2021, provided in Appendix A, overall construction (maximum daily emissions) for the proposed Project would not exceed the SCAQMD thresholds for the criteria pollutants reactive organic gas (ROG), oxides of nitrogen (NO_x), carbon monoxide (CO), oxides of sulfur (SO_x), and respirable and fine particulate matter ($_{PM10}$ and $_{PM2.5}$, respectively). The Project is estimated to generate less than the SCAQMD threshold of 75 pounds per day ROG, 100 pounds per day NO_x, 550 pounds per day CO, 150 pounds per day SO_x, 150 pounds per day PM_{10}, and 55 pounds per day $PM_{2.5}$ during the construction phase. Additionally, the Project is estimated to generate less than the SCAQMD threshold of 55 pounds per day ROG, 55 pounds per day NO_x, 550 pounds per day CO, 150 pounds per day SO_x, 150 pounds per day PM_{10}, and 55 pounds per day $PM_{2.5}$ during the operational phase. The primary sources of operations phase emissions would be on-road vehicles traveling to and from the site buildings and operational activities such as landscape equipment, energy use, and water use. The Project operational emissions output is also below the significance thresholds for the above-referenced criteria pollutants with regard to overall operational emissions.

The Project site is 37.87 acres in source-receptor area (SRA) Zone 28 – Hemet/San Jacinto Valley. The 5-acre screening lookup tables were used to evaluate NO_x, CO, PM_{10}, and $PM_{2.5}$ impacts on nearby receptors. The nearest receptor is approximately 50 meters (165 feet) away from the site boundary. Therefore, the impact evaluation was performed using the closest distance within SCAQMD Localized Significance Threshold (LST) tables of 50 meters for construction (SCAQMD 2008a).

The LST results provided in the Air Quality and Greenhouse Gas Study conducted by Yorke dated October 13, 2021, show that on-site emissions from construction and operations would meet the LST passing criteria at the nearest receptors (50 meters).

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Table 4-1 shows unmitigated and mitigated criteria construction emissions and evaluates mitigated emissions against SCAQMD significance thresholds.

Table 4-1: Construction Emissions Summary and Significance Evaluation

Criteria Pollutants	Unmitigated (lbs/day)	Threshold (lbs/day)	Significance
ROG (VOC)	41.3	75	LTS
NO_x	38.9	100	LTS
CO	31.5	550	LTS
SO_x	0.1	150	LTS
Total PM_{10}	21.2	150	LTS
Total$PM_{2.5}$	11.6	55	LTS

Sources: SCAQMD 2019, CalEEMod version 2020.4.0.

Notes:

lbs/day are winter or summer maxima for planned land use

Total PM_{10}/$PM_{2.5}$ comprises fugitive dust plus engine exhaust

LTS – Less Than Significant

Table 4-2 shows unmitigated and mitigated criteria operational emissions and evaluates mitigated emissions against SCAQMD significance thresholds.

Table 4-2: Operational Emissions Summary and Significance Evaluation

Criteria Pollutants	Unmitigated (lbs/day)	Threshold (lbs/day)	Significance
ROG (VOC)	13.0	55	LTS
NO_x	8.2	55	LTS
CO	65.0	550	LTS
SO_x	0.1	150	LTS
TotalPM_{10}	12.9	150	LTS
Total $PM_{2.5}$	3.7	55	LTS

Sources: SCAQMD 2019, CalEEMod version 2020.4.0.

Notes:

lbs/day are winter or summer maxima for planned land use

Total PM_{10}/$PM_{2.5}$ comprises fugitive dust plus engine exhaust

LTS – Less Than Significant

The LST results provided in Tables 4-3 and 4-4 show that on-site emissions from construction and operations would meet the LST passing criteria at the nearest receptors (50 meters).

Table 4-3: Construction Localized Significance Threshold Evaluation

Criteria Pollutants	Mitigated (lbs/day)	Threshold (lbs/day)	Percent of Threshold	Result
NO_x	38.9	416	9%	Pass
CO	31.5	2,714	1%	Pass

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Criteria Pollutants	Mitigated (lbs/day)	Threshold (lbs/day)	Percent of Threshold	Result
PM10	9.3	40	23%	Pass
PM2.5	5.4	10	54%	Pass

Sources: SCAQMD 2008a, CalEEMod version 2020.4.0.

Notes:

Source-receptor area Zone 28 – Hemet/San Jacinto Valley

5-acre area, 50 meters to receptor

Table 4-4: Operations Localized Significance Threshold Evaluation

Criteria Pollutants	Mitigated (lbs/day)	Threshold (lbs/day)	Percent of Threshold	Result
NO_x	8.1	416	2%	Pass
CO	64.0	2,714	2%	Pass
PM10	1.5	10	15%	Pass
PM2.5	0.5	3	18%	Pass

Sources: SCAQMD 2008a, CalEEMod version 2020.4.0.

Notes:

Mobile source PM_{10} and $PM_{2.5}$ emissions encompass 1-mile radius of Project site

Source-receptor area Zone 28 – Hemet/San Jacinto Valley

5-acre area, 50 meters to receptor

As shown in Tables 4-1, 4-2, 4-3, and 4-4, the proposed Project would result in a less than significant impact related to regional emissions, and no mitigation is required.

c) Expose sensitive receptors to substantial pollutant concentrations?

Impact: Less Than Significant Impact

A significant impact would occur if the proposed Project were to expose sensitive receptors to pollutant concentrations. The SCAQMD identifies the following as sensitive receptors: long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, childcare centers, and athletic facilities. The Project site is surrounded by residential uses, the nearest school is Clayton an elementary school that is 2 miles away, motherly care daycare is 0.5 miles away, the potter ranch park playground is next to the project site, the other sensitive receptors like hospitals retirement homes, residences, etc. are more than 3 miles away of the project site.

The Project is subject to grading and construction standards to mitigate air pollution and dust impacts. Additionally, the Project is not expected to substantially contribute to pollutant concentrations or expose surrounding residences and other sensitive receptors during operation (post-construction). The Project is required to meet SCAQMD Rule 403 requirements, as well as the City's requirements for demolition, grading, and construction related to air pollution. Therefore, construction and operation of the Project would result in a less than significant impact for both localized and regional air pollution emissions, and no mitigation is required.

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d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Impact: Less Than Significant Impact

Potential sources that may emit odors during construction activities include equipment exhaust and architectural coatings. Odors from these sources would be localized and generally confined to the immediate area surrounding the Project site. The proposed Project would utilize typical construction techniques, and the odors would be typical of most construction sites and temporary in nature. Construction of the proposed Project would not cause a long-term odor nuisance. According to the SCAQMD CEQA Air Quality Handbook, land uses and industrial operations that are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed single-family residential development would not result in activities that create objectionable odors. Therefore, the proposed Project would result in a less than significant impact related to objectionable odors, and no mitigation is required.

Mitigation Measures:

None required.

4.3.4 Biological Resources

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. Biological Resources. Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☑	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☑

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Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☑
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☑	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☑	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☑

Summary:

Biological resources information presented in this section is based on a project-specific General Biological & Biological Burrowing Owl Survey (Biological Survey) prepared by Hernandez, (2023), included as Appendix B of this document. Also, General Biological Assessment and Western Riverside County MSHCP consistency analysis, prepared in 2023. The Biological Survey fulfills the survey protocol defined by the Riverside County Multiple Species Habitat Conservation Plan (MSHCP) to provide a biological survey with focus on the burrowing owl.

Focused protocol surveys following the Burrowing Owl Survey Instructions for the Western Riverside County Multiple Species Habitat Conservation Plan Area were conducted from May 12 to June 29, 2022. The surveys determined BUOW is absent from the project site and 500-foot buffer. Foraging habitat is present, as evidenced by the presence of small rodent burrows.

The site is comprised of land used exclusively for recent active agricultural production as evidenced by the existing grading furrows. Impacts to the burrowing owl are expected to

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be limited to a loss of 37.84 acres of potential burrowing owl foraging habitat, but not direct "take" of the species.

Mitigations measures:

To address the significant impacts on burrowing owls, the project has conducted focused studies on the habitat of the burrowing Owls. As evidence the project site is located adjacent to two large housing clusters. Initial survey was conducted from the neighborhoods and the result was concluded on no presence of borrowing Owls at the site. Their habitat is mostly confined to places away from housing societies.

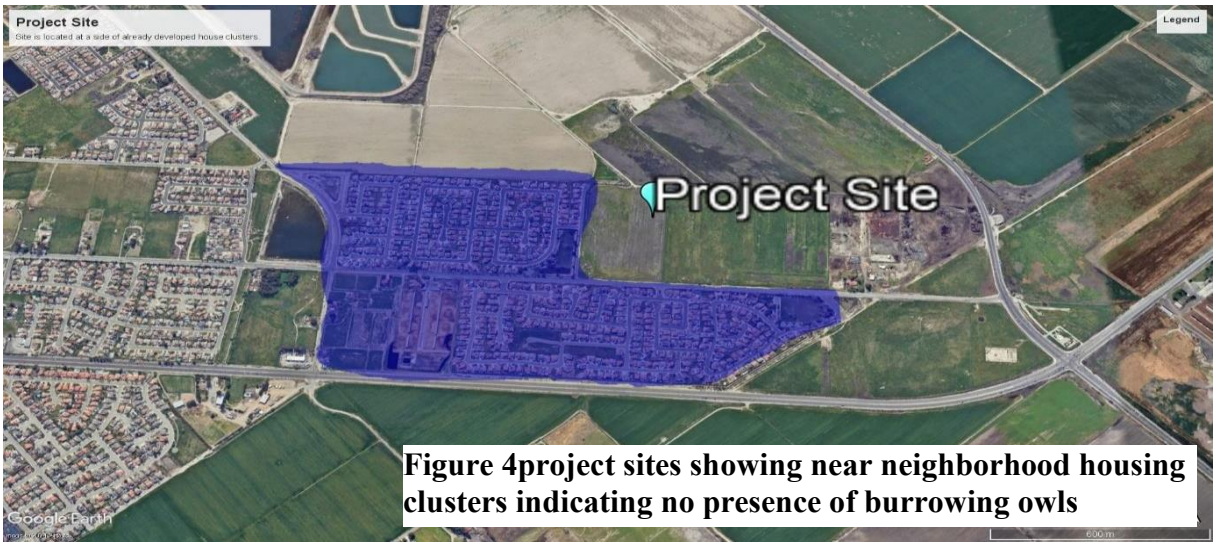

Figure 4project sites showing near neighborhood housing clusters indicating no presence of burrowing owls

If burrowing owls were detected, a buffer zone would develop to restrict construction and other measure in the habitat premises of the Owls. If burrowing owls are present, additional mitigation and protective plans to relocating the owls to a safe habitat underthe guidance of a qualified biologist would be included to ensure noise and vibration reduction measures during construction to prevent disturbance to the owls. In case of owl colonization,the project team would inform RCA about the case.

A buffer zone of more than 1 kilometers around the project site was conducted under analysis for the presence of the burrowing Owls but no evidence of their presence was found. The preferable habitat or borrowing Owls are desert, grasslands, agriculture fields away from human residential and commercial sites. To north – west the presence of housing cluster presents strong evidence in this regard and PRA (Preliminary Risk Assessment) from the neighborhood proves no indicationof the presence of the burrowing Owls.

Environmental Determination:

a) Has a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Impact: Less Than Significant with Mitigation Incorporated

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The Project site is located within the Western Riverside County MSHCP burrowing owl survey area[1]. The burrowing owl is a California Department of Fish and Wildlife (CDFW)species of special concern. The preferred habitat for the burrowing owl includes grasslands, shrub land, and savannas (The Cornell Lab, 2023).[2]Burrowing owls also occur in other open areas such as agricultural lands, old fields, extensive forest clearings, airports, gold courses, and spacious residential zones. No burrowing owls or burrowing owl burrows were observed on the 37.84-acre site during the burrowing owl surveys performed as part of the Biological Survey. The MSHCP requires a 30-day preconstruction survey prior to commencement of activities to ensure there are no burrowing owls or burrowing owl burrows present on-site. This requirement is included as Mitigation Measure BIO-1.

As previously mentioned, the river biodiversity is situated approximately 2 kilometers from the project site, a distance that ensures the project activities have no direct or indirect impacton the riverside ecosystem. The project incorporates several measures to maintain this minimal impact, as detailed below:

1. Predefined Dumping Site: The project includes a designated dumping site for waste materials, established by the local administration. This ensures that all waste, including construction debris and other refuse, is systematically collected and disposed of in a manner that prevents contamination or disruption of nearby natural habitats. By following these predefined disposal protocols, the project minimizes the risk of pollutants entering the riverside ecosystem.

2. Wastewater Management: The project has a robust wastewater management system in place. Wastewater generated from project activities is channeled through a dedicated pipeline that connects to the already established main duct line managed by the local administration. This system ensures that all dirty water is effectively treated and disposed of,preventing any runoff from reaching the river. The main duct line is designed to handle significant volumes of wastewater and includes treatment facilities to ensure that discharged water meets environmental standards.

3. Distance Buffer: The 2-kilometer distance between the project site and the river provides a natural buffer, reducing the likelihood of any accidental spills or contamination reaching the river. This buffer zone is sufficient to absorb and mitigate any potential pollutants before they can impact the riverside biodiversity.

4. Regular Monitoring and Compliance: The project includes regular environmental monitoring to ensure compliance with environmental regulations and standards. This includes frequent inspections and assessments to verify that waste disposal and wastewater treatment processes are functioning correctly and that there are no breaches of containment systems.

5. Stakeholder Involvement: The involvement of multiple stakeholders, including environmental experts, local authorities, and community representatives, ensures that the project adheres to best practices in environmental management. These stakeholders collaborate to monitor the project's impact and implement any necessary adjustments promptly.

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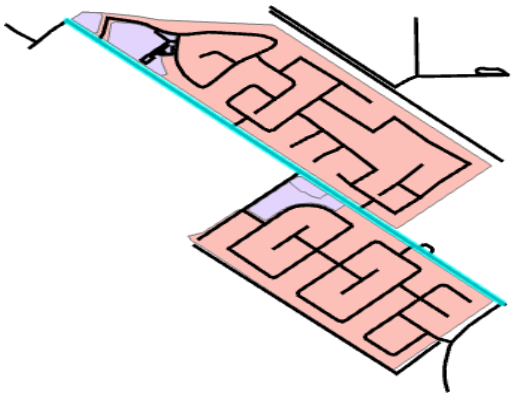

Figure 5 duct and sewage line on the project site for safe disposal of dirt water

By incorporating these comprehensive measures, the project effectively mitigates any potential adverse effects on the riverside biodiversity, ensuring that the ecological integrity ofthe river is preserved while allowing for sustainable development.

The precaution measures ensure to include the California fish and game code at the beginning, during and after completion of the project. A proper designed sewage connectionis ensured to safety runoff of the debris. The project has no impact on the runoff, vegetation,drainage pattern and sedimentation of the riverside network and delineation.

To sums up, no special-status plant or wildlife species were observed within the biological survey area. Therefore, impacts to special-status species from Project disturbances in the temporary and permanent impact areas would be less than significant with mitigation.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Impact: No Impact

According to the U.S. Fish and Wildlife Service, “riparian areas are plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic and lentic water bodies (rivers, streams, lakes, or drainage ways)” (U.S. FWS 2019).

The project site contains bare agriculture with planting furrows present in 95% of the site and few non-native annual weeds on the perimeter. One reticular cotton wood is present. The project site does not contain, nor is it adjacent to, any channels, streambed, lakes, ponds, or other riverine resources. I addition, there are no potential vernal pools or other ponding areas.

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In conclusion, The Biological Survey states that “no riparian habitat is present on-site.” Furthermore, the proposed Project is not located adjacent to any water bodies and would have no impact on any riparian habitat. According to the Biological Survey, the Project site is a recently active agricultural field that has seen repeated historical discing and furrowing. Furthermore, the Biological Survey did not find sensitive alkaline flora or intact habitat for rare plants present at the Project site.

The project site is strategically positioned to ensure it has no impact on any surrounding water networks. Specifically, the San Jacinto River, located over 3 kilometers to the northwest, remains untouched by our activities. Additionally, the nearest water bodies, the Casa Loma Canal and the San Jacinto Dam, are situated more than 1 kilometer away and fall completely outside the project’s influence zone. The detailed map attached clearly illustrates the safe distances between our project and these vital water resources, guaranteeing their protection and preservation.

The below Maps shows the detail location and names of the water bodies to the project site. By analysis using GIS tool with the real time data it is concluded that the mentioned water bodies are not in the impact zone of the project area.

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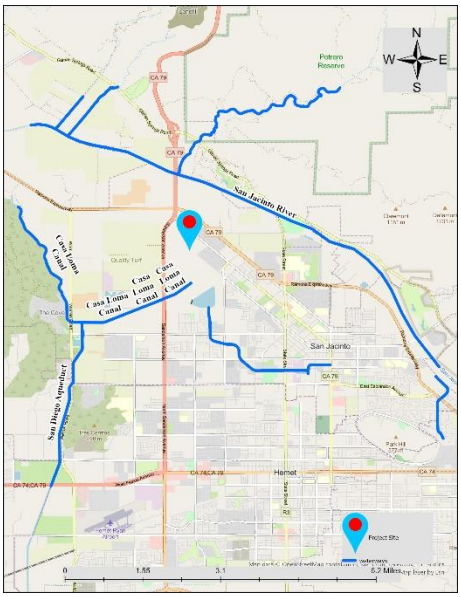

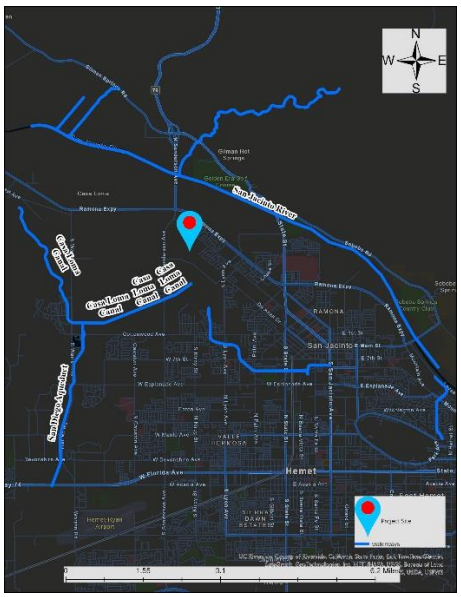

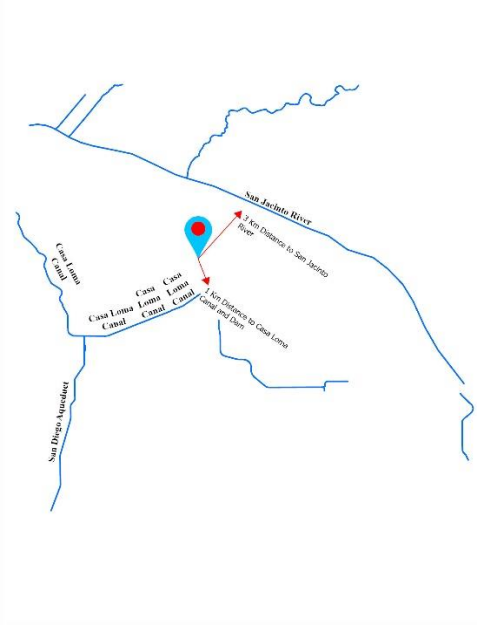

The above sketch also shows the distance to the water bodies from the proposed project site. Based on these ground survey data and GIS analysis the project site does not require any mitigation measure which may impact the riparian resource.

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c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Source: [1]https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=1872.
[2]Cornell University Website: https://www.allaboutbirds.org/guide/Burrowing_Owl/lifehistory

Impact: No Impact

Under Section 404 of the federal Clean Water Act, wetlands are defined as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (U.S. EPA 2022). No wetlands or streams were detected within or immediately adjacent to the impact area; therefore, no impacts to wetland or streams would occur. Furthermore, the National Wetlands Inventory identifies predominantly freshwater emergent wetlands and freshwater ponds surrounding the Project site (USGS 2022). Collectively, these mapped wetlands are more than 100 feet from the impact area, adhering to the minimum buffer strip requirement per the Coastal Zoning Ordinance. Therefore, the proposed Project would have no impact on any State or federally protected wetlands.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Impact: Less than Significant Impact

Wildlife corridors are passages through which wildlife species travel to complete their life cycles. The project area was evaluated for its function as a wildlife corridor that species use to move between wildlife habitat zones. The site consists of flat ruderal or disturbed land surrounded by storage facilities, commercial development, and busy roads. No wildlife movement corridors were found to be present on the project site. (Hernandez Environmental Services, 2023)[1]

However, the Biological Survey identified several active rodent and ground squirrel burrows. The burrowing owl, which is a State of California species of concern, typically lives in colonies and uses burrows excavated by other animal species for cover. In California, burrowing owls primarily use ground squirrel burrows for breeding, nesting, and brooding. No burrowing owls or burrowing owl burrows were observed on the Project site during the protocol burrowing owl surveys.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Impact: Less than Significant Impact

According to Hernandez Environmental Services, 2023. [1]The development of the project site would not conflict with local policies or ordinances protecting biological resources. There are no tree preservation ordinances and therefore the removal of the trees will not conflict with an ordinance.

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The Biological Survey defined Shrubs and trees on the project site contain potential nesting opportunities in ornamental trees during the nesting bird season of February 1 through September 15.

Implementation of the measures identified in the General Biological Assessment and Western Riverside County MSHCP, will ensure that potential impacts to nesting birds are less than significant with the inclusion of mitigation measures MM-BIO-1 through 3, also, determined that the site does provide suitable burrows/nesting opportunities for burrowing

Source: [1.]General biological assessment and western riverside county MSHCP consistency analysis For TTM 3806

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Impact: No Impact

The project is within the Western Riverside MSHCP. If Western Riverside MSHCP guidelines and requirements are followed, no conflicts are expected (Hernandez Environmental Services, 2023) [1.]

According to the above mentioned, the project area is located within the San Jacinto Valley Area Plan of the Western Riverside County MSHCP. The project site is not located within a MSHCP Criteria Cell or Cell Group which refers that there are no designated areas in the plan that have particular characteristics or significance for the conservation of specific species or habitats. In addition, the site is not located within plan-defined areas requiring surveys for criteria area species, amphibian species, narrow endemic plants, or mammalian species. Therefore, the proposed Project would have no impact on an approved habitat conservation plan.

The project site is located along already established housing clusters and has no record of vegetation activity from decades studies through the past satellite image analysis. Therefore,the site is clear from any type of habitat habituating reptiles or other species. The following image shows the site image from 2006 and has no evidence of vegetation cover and crops. The suitable habitat for foraging species is grasslands or crops with lots of insect. The projectsite is a barren land and as the analysis of satellite images shows no historical record of crops more than a decade. In this regards a survey for nesting behavior was also conducted but noevidence of nesting was found as the site is located beside a bust housing clusters which makes it unfavorable for species to dwell there both permanently and temporarily.

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Further to avoid the circumstances the proposed mitigation measures are ensured while constructing in the site, especially a technical biologist with assist in such case if needed. But based on the field and remote analysis there are no evidence of habitat.

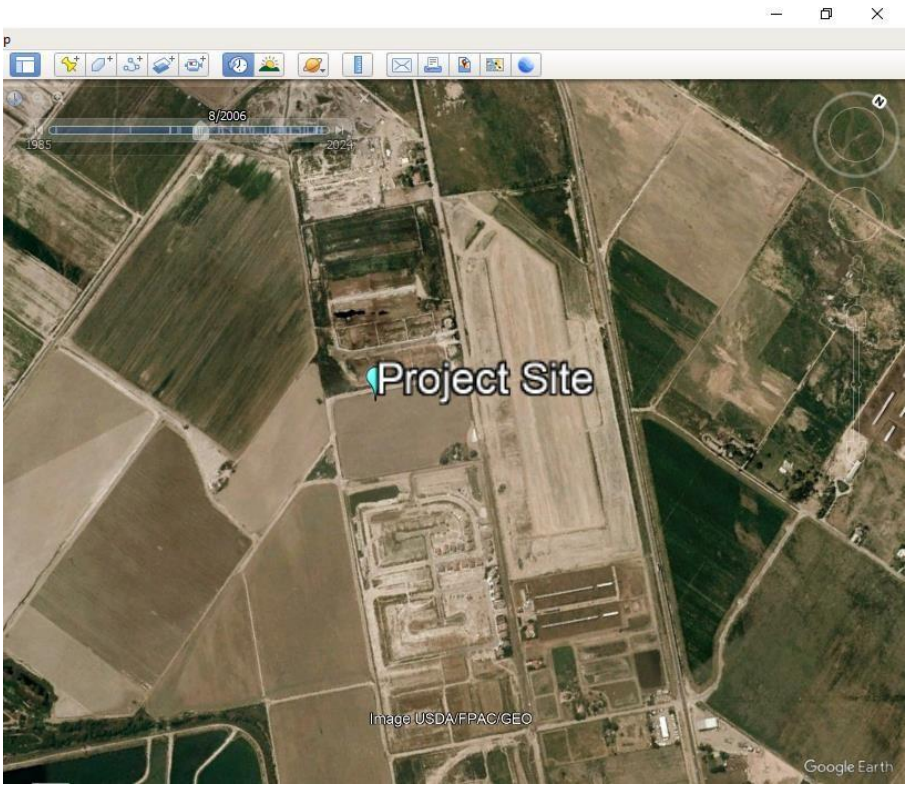

Figure 6 Project site indicating no evidence of tress, crops or nesting habitats

Mitigation Measures:

MM-BIO-1: Burrowing Owl: Due to the presence of potentially suitable habitat, four focused burrowing owl surveys shall be conducted on the Project area and within a 500-foot buffer during the burrowing owl breeding season (March 1 through August 31) in accordance with the Western Riverside MSHCP Burrowing Owl Survey Instructions (County of Riverside, 2006). If survey results are negative (i.e., no occupied burrows or live burrowing owls are detected) and ground-disturbing Project activities are scheduled to begin within 30 days of the final survey, then no additional preconstruction survey or biological monitoring requirements will be necessary. A preconstruction burrowing owl survey within 30 days of the onset of grading is required prior to initial ground-disturbing activities (including vegetation, clearing, clearing, and grubbing, tree removal, site watering, equipment, staging, grading, etc.). because the site includes potential foraging habitat for the burrowing owl as existing ground squirrel burrows could be occupied between the time of the writing of this report and the start of grading.

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If burrowing owls have colonized the project site prior to the initiation of ground-disturbing activities, the project proponent will immediately inform the Regional Conservation Authority (RCA) and the Wildlife Agencies and will need to coordinate further with RCA and the Wildlife Agencies, including the possibility of preparing a Burrowing Owl Protection and Relocation Plan, prior to initiating ground disturbance. An experienced biologist will need to verify if any burrowing owls within the project site are breeding or wintering, a Burrowing Owl Protection and Relocation Plan will be prepared detailing passive (e.g., use of one-way doors and collapse of burrows) and/or active (e.g., capturing owls, relocating to a new site, and collapse of burrows) relocation methods. The Burrowing Owl Protection and Relocation Plan will be submitted to CDFW and USFWS for approval prior to initiating ground disturbance within the project site. The Burrowing Owl Plan shall describe proposed avoidance, monitoring, relocation, minimization, and/or mitigation actions. The Burrowing Owl Plan shall include the number and location of occupied burrow sites, acres of burrowing owl habitat that will be impacted, details of site monitoring, and details on proposed buffers and other avoidance measures if avoidance is proposed. If impacts to occupied burrowing owl habitat or burrow cannot be avoided, the Burrowing Owl Plan shall also above be necessary.

In accordance with the guidelines stipulated in the CDFW Report on Burrowing Owl Mitigation, comprehensive surveys were conducted. The survey protocol entailed traversing suitable habitats throughout the entire survey area, including a 500-foot buffer zone, or utilizing visual observation methods where physical access was not feasible. Before commencing the walking surveys, the biologist employed binoculars to scrutinize the area for suitable habitats. The biologist conducted surveys from March to August to detect the presence of Burrowing Owls during the breeding season. Ecological Sciences' biologist initiated the first of four focused breeding season surveys. The habitat was determined to be unsuitable for Burrowing Owls, resulting in no detections.

The survey report concluded with no presence of Burrowing Owls, thereby negating the need for further surveys. Consequently, Phase IV of the summary report was prepared, detailing the results of each survey phase. A pre-construction survey was also conducted to reassess the presence of Burrowing Owls.

No Burrowing Owls were detected during the surveys, and therefore, no mitigation measures are required.

MM-BIO-2: Preconstruction Surveys for Nesting Birds and Raptors. To prevent direct impacts to nesting birds, including raptors, protected under the federal MBTA and CFG Code Sections 3503, 3503.5, and 3513, the following measures shall be implemented:

Construction should be conducted outside of the avian and raptor breeding season. If construction must take place during the nesting season, a qualified biologist shall perform a pre-construction survey for nesting birds within the project site, including a 500ft buffer around the disturbance footprint to confirm the absence of active nests belonging to migratory birds and raptors afforded protection under the MBTA and CFG

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Code.

The pre-construction nesting bird survey shall be performed no more than three days prior to the start of construction. The results of the pre-construction survey shall be documented by the qualified biologist and shall be provided to the Applicant. The Project Applicant shall adhere to the following:

1. Applicant shall designate a biologist (Designated Biologist) experienced in: identifying local and migratory bird species of special concern; conducting bird surveys using appropriate survey methodology; nesting surveying techniques, recognizing breeding and nesting behaviors, locating nests and breeding territories, and identifying nesting stages and nest success; determining/establishing appropriate avoidance and minimization measures; and monitoring the efficacy of implemented avoidance and minimization measures.
2. Pre-activity field surveys shall be conducted at the appropriate time of day/night, during appropriate weather conditions, no more than 3 days prior to the initiation of Project activities. Surveys shall encompass all suitable areas including trees, shrubs, bare ground, burrows, cavities, and structures. Survey duration shall take into consideration the size of the Project site; density, and complexity of the habitat; number of survey participants; survey techniques employed; and shall be sufficient to ensure the data collected is complete and accurate. If nesting birds are not found within the project site, site preparation and construction activities may begin during the nesting/breeding season.

If nesting birds or active nests (including nesting raptors) are identified, then avoidance or minimization measures shall be undertaken in consultation with the City of San Jacinto and the California Department of Fish and Wildlife. Measures shall include immediate establishment of avoidance buffers which shall be implemented as determined by the qualified biologist and approved by the City of San Jacinto, based on their best professional judgement and experience. The buffer shall be of a distance to ensure avoidance of adverse effects to the nesting bird by accounting for topography, ambient conditions, species, nest location, and activity type. The buffer around the nest shall be delineated and flagged, and all work within these buffers shall be halted until a qualified biologist determines the nesting effort is finished (i.e., the juveniles are surviving independent from the nest, or the nest has failed). The biologist shall monitor the nest at the onset of project activities, and at the onset of any changes in such project activities (e.g., increase in number or type of equipment, change in equipment usage, etc.) to determine the efficacy of the buffer. If the biologist determines that such project activities may be causing an adverse effect, alternative avoidance and minimization measures, such as redirecting or rescheduling construction or erecting sound barriers, shall be implemented. If vegetation clearing is not initiated within 72 hours of a negative survey during the nesting season, the nesting survey must be repeated to confirm the absence of nesting birds. Upon completion of the survey and nesting bird monitoring, a report shall be prepared and submitted to City of San Jacinto Planning Division for mitigation monitoring compliance record keeping.

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MM-BIO-3: Weed Management Plan. A weed management plan should be developed for the Project site and implemented during the duration of this Project. On-going soil disturbance promotes establishment and growth of non-native weeds. As part of the Project, non-native weeds should be prevented from becoming established. The Projects site should be monitored via mapping for new introductions and expansions of non-native wee.

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In the event that no nesting birds or active nests are found during the survey, the Project site is permitted to proceed with site preparation and construction activities as planned. However, if nesting birds or active nests, including those of raptors, are identified during the survey, the Applicant must implement avoidance or mitigation measures. These measures, determined in consultation with relevant authorities such as the City of San Jacinto and the California Department of Fish and Wildlife, may include establishing avoidance buffers around the nests. The buffer size and implementation specifics will be determined by the qualified biologist based on their expertise and professional judgment, considering factors such as topography, ambient conditions, species involved, nest location, and type of construction activity.

Overall, adherence to these pre-construction survey and mitigation measures ensures compliance with federal regulations protecting nesting birds and raptors, thereby minimizing potential impacts to these species during construction activities. A preconstruction survey within the footprint of the construction site was ensured with the presence of qualified biologists to assess the presence of nesting birds and raptors to avoid direct impacts.

Source: [1]General biological assessment and western riverside county MSHCP consistency analysis For TTM 3806

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4.3.5 Cultural Resources

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
V. Cultural Resources. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☑	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☑	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☑	☐	☐

Summary:

Cultural resources information presented in this section is based on a Project-specific Phase I Cultural Resources Assessment (Phase I Assessment) prepared by Archaeological Associates (2023), and conducted by Robert S. White (Principal Investigator, County Approved Archaeologist #164).

Phase I Cultural Resources Assessment of 37.84 acres of vacant land identified as the Valle Reseda project site, Tract 38066 (APNs 436-030-001, 436-040-006 & -008). The study area is located immediately southwest of the intersection of North Ramona Boulevard and Ranch View Lane in the City of San Jacinto, Riverside County. Presently, it is desired to construct a residential subdivision on the property.

The purpose of this study was to identify all potentially significant cultural resources situated within the boundaries of the study area. This information is needed since adoption of the proposed development plan could result in adverse effects upon locations of archaeological or historical importance. All field notes, background research, and photographs are in the possession of Archaeological Associates. The assessment consisted of: (1) a partial records search conducted to determine whether any previously recorded historic or prehistoric material is present on the property, (2) literature and archival review, (3) Sacred Lands File Check/Native American Scoping, and (4) a field reconnaissance intended to identify any previously unrecorded cultural resources within the boundaries of the Project area.

Environmental Determination:

a) Cause substantial adverse change in the significance of a historical resource pursuant to §15064.5?

Impact: Less Than Significant with Mitigation Incorporated (presumptive finding)

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An in-person records search of the study area was conducted by Robert S. White on August 24, 2023, at the Eastern Information Center (EIC), University of California. The search also included a review of all previously recorded prehistoric and historic resources situated within a one-mile radius of the project area. Additionally, the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), California Historical Landmarks (CHL), California Points of Historical Interest (CPHI), and the California Directory of Properties (DOP, aka the Historic Resources Inventory [HRI]) were reviewed for the purpose of identifying historic properties.

The results of the records search indicated that no prehistoric or historic sites or isolates have been previously recorded within the boundaries of the study area. There is no "Historical resources" determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (Pub. Res. Code §5024.1, Title 14 CCR, Section 14 CCR, Section 4850 et seq.).

Further analysis and geospatial study of the infrastructure data in San Jacinto confirms the absence of any cultural resources within or near the project area. Updated data collected from OSM, and other geospatial platforms also supports this finding of no cultural resources present.

The proposed Project is not anticipated to cause a substantial adverse change in the significance of a historical resource. Therefore, the authors preliminarily conclude that the impact will be less than significant, provided that mitigation measures MM-CUL-1, MM-CUL-2, MM-CUL-3, and MM-CUL-4, as outlined below, are not required to be implemented.

b) Cause substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

Impact: Less Than Significant with Mitigation Incorporated

No structures meeting the criteria of a historical resource pursuant to Section 15064.5 are located within or immediately surrounding the proposed Project site. However, there still remains the possibility of encountering concentrations of cultural remains within areas of moderate, low, or no cultural materials, as well as inadvertently encountering isolated artifacts or human remains within previously disturbed soils. In the event that unanticipated archaeological resources are encountered during Project implementation, impacts to these resources could be potentially significant.

The mitigation measures have been created to minimize impacts to cultural resources to less than significant. Implementation of MM-CUL-1 would establish a program of treatment and mitigation in the case of an inadvertent discovery of cultural resources during ground-disturbing phases and would provide for the proper identification, evaluation, treatment, and protection of any cultural resources throughout the duration of the proposed Project; MM-CUL-2 would ensure the preparation and implementation of a Worker Environmental Awareness Program (WEAP); MM-CUL-3 would ensure that a qualified archaeologist is retained to monitor all initial ground disturbing activities and to respond

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to any inadvertent discoveries during Project construction; and MM-CUL-4 would ensure the proper treatment and protection of any inadvertent discovery of cultural resources, including human remains and burial artifacts, and that all construction work occurring within 50 feet of the find shall immediately stop until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for Archaeology, can evaluate the significance of the find. Thus, potentially significant impacts to archaeological resources would be reduced to less than significant levels with MM-CUL-1 through MM-CUL-7 incorporated. The mitigation measures have been developed to ensure that impacts related to cultural resources, including human remains and burial artifacts, are minimized to levels deemed less than significant. These measures are crucial for addressing any potential discoveries during ground-disturbing phases of the proposed Project. Implementation of MM-CUL-1 establishes a comprehensive program for treatment and mitigation in the event of inadvertent cultural resource discoveries, emphasizing proper identification, evaluation, treatment, and protection throughout Project duration. MM-CUL-2 mandates the adoption of a Worker Environmental Awareness Program (WEAP) to enhance on-site cultural resource management practices.

c) Disturb any human remains, including those interred outside of dedicated cemeteries?

Impact: Less Than Significant with Mitigation Incorporated

As stated in the Phase I Assessment, the partial records search and field survey failed to indicate the presence of any prehistoric or historic archaeological resources within the boundaries of the study area. Consequently, no additional work in conjunction with cultural resources is recommended, including monitoring of any future earth-disturbing activities.

In the event that human remains are encountered during the course of any future development, California state law (Health and Safety Code Section 7050.5 and PRC Section 5079.98) states that no further earth disturbance shall occur at the location of the find until the Riverside County Coroner has been notified. If the remains are determined to be prehistoric, the coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD). Furthermore, implementation of MM-CUL-1 through MM-CUL-7 would ensure potentially significant disturbances are reduced to less than significant levels.

Mitigation Measures:

MM-CUL-1: Before a grading permit is issue, the developer must finalize a treatment and disposition Agreement (TDA) with the Soboba Band of Luiseno Indians. This agreement will outline procedures for handling archeological/cultural resources and human remains related to the Soboba Band of Luiseno Indians that may be found during the construction. The TDA may also include provisions for tribal monitors. Once signed by both parties, the TDA will become part of the grading permit.

MM-CUL-2: Prior to grading permit issuance the developer shall retain a qualified archaeologist and a Native American Monitor to prepare an Archaeological Mitigation and

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Monitoring Plan (AMMP). The AMMP shall include the monitoring of all ground disturbing activities and shall include protocol for the mitigation and significance testing of inadvertent archaeological finds.

MM-CUL-3: Inadvertent Discovery of Paleontological Resources: If paleontological resources are encountered during grading, ground disturbance activities shall cease so a qualified paleontological monitor can evaluate any paleontological resources exposed during the grading activity If paleontological resources are encountered, adequate funding shall be provided to collect, curate and report on these resources to ensure the values inherent in the resources are adequately characterized and preserved. Collected specimens will be sent to the appropriate authorities for collection.

MM-CUL-4 / MM-TCR-1: Inadvertent Discovery of Archaeological Resources. If an archeological/cultural assessment demonstrates the potential for archeological/cultural resources to occur on the project site, tribal monitors, including the Soboba Band of Luiseno Indians may be allowed to monitor all grading, excavation, ground-disturbing activities, including further survey. Following the agreement of the City, the designated archeologist, the tribal monitor, and any applicable responsible or trustee agencies, grading, excavation, ground-disturbing activities shall be stopped temporarily and redirected in the event any archeological/cultural resources are discovered in order to evaluate the significance of any archeological/cultural resource discovered on the property.

MM-CUL-5: Treatment and Disposition of Remains: If human remains are encountered on the property, then the Riverside County Coroner's Office and Soboba Band, MUST be contacted within 24 hours of the find, and all work (within 50-feet of the find) halted until a clearance is given by that office and any other involved agencies. If it is determined that the remains might be those of a Native American, the California Native American Heritage Commission and the Soboba Band of Luiseno Indians and NAHC shall be notified within twenty-four (24) hours, and appropriate measures provided by State law shall be implemented.

MM-CUL-6: Non-disclosure of Location Reburials: It shall be the understanding by all parties that unless otherwise required by law, the site of reburial of Native American human remains or cultural artifacts shall not be disclosed and shall not be governed by public disclosure requirements of the California Public Records Act. The coroner, parties, and the City, shall not withhold public disclosure information related to such reburial, pursuant to the specific exemption set forth in California Government Code 6254®

MM-CUL-7: Treatment and Disposition of Cultural Items: Ceremonial items and items of cultural patrimony reflect traditional religious beliefs and practices of the Tribal Band. The developer shall agree to return all Native American ceremonial items, artifacts, and items of cultural patrimony that may be found on the project site to the appropriate Tribal authority for treatment. In addition, all other cultural items (artifacts) that are recovered during the course of archaeological investigations shall be returned to the appropriate Tribal authorities. Where appropriate and agreed upon in advance, the Developer's archeologist may conduct limited non-destructive analyses of certain artifact classes if required by applicable law, i.e. CEQA, Section 106 of the NHPA, these mitigation

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measures, or any associated conditions of approval for the Project. This may include but is not limited or restricted to including shell, bone, ceramic, stone, or other artifacts.

The Developer shall waive any and all claims to ownership of Native American ceremonial and cultural artifacts that may be found on the Project Site. Upon completion of authorized and mandatory archeological analysis, the Developer shall return said artifacts to the appropriate Tribe within a reasonable time period but not to exceed thirty (30) days.

The Tribe associated with the cultural items (artifacts) may wish to rebury the cultural items (artifacts) on or near, the site of discovery, in an area that shall not be subject to future subsurface disturbances. The developer shall accommodate on-site reburial in a location mutually agreed upon by the parties.

4.3.6 Energy

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. Energy. Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☑	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☑	☐

Energy information presented in this section is based on a project-specific Air Quality Technical Evaluation prepared by Yorke Engineering, LLC from October 13, 2021, included as Appendix A of this IS/MND.

Methodology:

Residential project energy consumption primarily comprises: 1) mobile source fuels (i.e., diesel, gasoline) used for construction; 2) area and mobile source fuels used for operation (e.g., residents and deliveries); and 3) building utilities (direct natural gas and electric power, and indirect electric power).

Project Construction Fuel Consumption

The fuel consumption from the mobile sources used for construction was calculated from the results of the CalEEMod modeling procedure. CalEEMod calculates mass emissions of GHGs, including carbon dioxide (CO_2), from offroad and on road mobile sources associated with project construction. For construction, CalEEMod aggregates mobile

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source CO_2 emissions into four broad categories: offroad equipment, heavy trucks (hauling), medium trucks (vendors), and light trucks and automobiles (workers).

For each category, diesel and gasoline fuel consumption was calculated using the 2020 Climate Registry [Code of Federal Regulations (CFR) Title 40 Part 98 Subpart C] emission factors for those fuels. As shown in Table 4-5, based on CalEEMod, Project construction could consume approximately 312,000 gallons of liquid fuels.[1]

Table 4-5: Construction Mobile Source Energy Use – CalEEMod Basis

Mobile Sources	Types	Fuels	MT CO_2	CO_2 Emission Factor (kg/gal)	Fuel Consumption (gallons)
Off-Road	Tiers 1-4	Diesel	1,174	10.21	115,000
Hauling[1]	HHDT	Diesel	0	10.21	0
Vendor	MHDT, HHDT	Diesel	772	10.21	75,600
Worker	LDA, LDT1, LDT2[1]	Gasoline	1,066	8.78	121,400
Totals			**3,012**	–	**312,000**

Sources: CalEEMod version 2020.4.0, TCR 2020, 40 CFR Part 98 Subpart C.

Project Operation Fuel Consumption

Similar to construction, CalEEMod calculates mass emissions of CO_2 from area and mobile sources associated with Project operation. For operation, CalEEMod aggregates area and mobile source CO_2 emissions into three broad categories: utility equipment, heavy mobile sources (heavy trucks), and light mobile sources (medium and light trucks and automobiles).

For each category, diesel and gasoline fuel consumption was calculated using the 2020 Climate Registry (40 CFR Part 98 Subpart C) emission factors for those fuels. Consistent with CalEEMod, residential land use operational vehicle fleet mixes comprise approximately 95% gasoline and 5% diesel fuel usage.

As shown in Table 4-6, based on CalEEMod, Project operation could consume approximately 210,900 gallons of liquid fuels annually.

Table 4-6: Operational Area and Mobile Source Energy Use – CalEEMod Basis

Sources	Types	Fuels	MT CO_2 per year	CO_2 Emission Factor (kg/gal)	Fuel Consumption (gallons/year)
Area	Utility Equipment	Gasoline	2.9	8.78	300
Heavy Mobile	LHDT, MHDT, HHDT	Diesel	93	10.21	9,100
Light Mobile	LDA, LDT1, LDT2, MDV[1]	Gasoline	1,769	8.78	201,500
Totals			**1,865**	–	**210,900**

[1] For this Project, no large-scale hauling is expected (i.e., no demolition or substantial earth import/export).

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Sources: CalEEMod version 2020.4.0, TCR 2020, 40 CFR Part 98 Subpart C.

Project Operation Utilities Consumption

Based on CalEEMod for the defined land use, Table 4-7 shows estimated natural gas and electric power usage for the proposed Project. The amounts of natural gas and electricity used directly by residents is provided in the CalEEMod output. Natural gas usage is consistent with the SCAQMD-approved default higher heating value (HHV) of 1,050 British thermal units (Btu) per cubic foot.

The indirect electric power associated with water used by residents was calculated from the CalEEMod indoor and outdoor water consumption results and CalEEMod energy i [1]. All, Light-Duty Truck 1, Light-Duty Truck 2, Medium-Duty, Vehicle stewater treatment as applicable.

As shown in Table 4-7, Project operation would result in natural gas usage of approximately 4.76 million cubic feet (MMcf) per year and utilization of approximately 1,622 megawatt-hours (MWh) per year of electric power in aggregate.

Table 4-7: Operational Utility Energy Use – CalEEMod Basis

Component	Type	Quantity	Units
Home Utilities	Natural Gas	4.76	MMcf/year
Home Utilities	Electric Power	1,418	MWh/year
Water – Indoor Use	Electric Power	125	MWh/year
Water – Outdoor Use	Electric Power	79	MWh/year

Source: CalEEMod version 2020.4.0.

Environmental Determination:

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy?

Impact: Less Than Significant Impact

The residential Project will be required by code (below) to minimize direct operational energy usage by means of thermal wall insulation, insulating double-pane windows, high-efficiency heating, ventilation, and air conditioning (HVAC) equipment, light-emitting diode (LED) lighting, motion-detector light switches, Energy Star® appliances, and other modern energy-saving features. In addition, low flow plumbing fixtures conserve both water and energy, as less electric power would be needed for water conveyance and treatment.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Impact: Less Than Significant Impact

The Project would not conflict with or obstruct any adopted energy conservation plans or state or local plans for renewable energy or energy efficiency. The California Building Energy Efficiency Standards (24 CCR Parts 6 and 11) are designed to reduce unnecessary energy consumption in newly constructed and existing buildings, such as residential and

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commercial structures. The Building Energy Efficiency Standards are applicable to the proposed Project, which is designed for human habitation (CEC 2019). The proposed Project would support plans for Level 2 electric vehicle charging stations to reduce fuel consumption and rooftop solar photovoltaic (PV) panels to provide on-site renewable energy generation. Both of these measures would also reduce GHG emissions overall. Thus, the proposed Project would not conflict with Title 24 or obstruct its implementation on applicable land use development projects in California.

Mitigation Measures:

None required.

4.3.7 Geology and Soils

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. Geology and Soils. Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☑	☐
ii) Strong seismic ground shaking?	☐	☐	☑	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☑	☐
iv) Landslides?	☐	☐	☐	☑
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☑	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☑	☐

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Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☑
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☑
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☑	☐

Information Sources:

Some geologic and soils information presented in this section is based, in part, on a Project-specific General Biological & Biological Burrowing Owl Survey (Biological Survey) prepared by Hernandez, (2023) and a Phase I Cultural Resources Assessment (Phase I Assessment) prepared by Archaeological Associates (2021), included as Appendices Band C of this IS, respectively. Other information has been gathered primarily via desktop review.

Regulatory Setting:

Federal

Occupational Safety and Health Administration Regulations

Excavation and trenching are among the most hazardous construction operations. The Occupational Safety and Health Administration (OSHA) Excavation and Trenching Standard, 29 CFR Part 1926, Subpart P, covers requirements for excavation and trenching operations. OSHA requires that all excavations in which employees could potentially be exposed to cave-ins be protected by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area.

State

California Building Standards Code

The State regulations protecting structures from geo-seismic hazards are contained in the California Building Code (CBC) (24 CCR Part 2), which is updated on a triennial basis. These regulations apply to public and private buildings in the State. Until January 1, 2008, the CBC was based on the then-current Uniform Building Code and contained additions,

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amendments, and repeals specific to building conditions and structural requirements of the State of California. The 2019 CBC, effective January 1, 2020, is based on the 2018 International Building Code and enhances the sections dealing with existing structures. Seismic-resistant construction design is required to meet more stringent technical standards than those set by previous versions of the CBC.

Chapters 16 and 16A of the 2019 CBC include structural design requirements governing seismically resistant construction, including (but not limited to) factors and coefficients used to establish seismic site class and seismic occupancy category for the soil/rock at the building location and the proposed building design. Chapters 18 and 18A include the requirements for foundation and soil investigations (Sections 1803 and 1803A); excavation, grading, and fill (Sections 1804 and 1804A); damp-proofing and waterproofing (Sections 1805 and 1805A); allowable loadbearing values of soils (Sections 1806 and 1806A); the design of foundation walls, retaining walls, embedded posts and poles (Sections 1807 and 1807A), and foundations (Sections 1808 and 1808A); and design of shallow foundations (Sections 1809 and 1809A) and deep foundations (Sections 1810 and 1810A). Chapter 33 of the 2019 CBC includes requirements for safeguards at work sites to ensure stable excavations and cut or fill slopes (Section 3304).

Construction activities are subject to occupational safety standards for excavation and trenching, as specified in the California Division of Occupational Safety and Health (Cal/OSHA) regulations (Title 8 CCR) and in Chapter 33 of the CBC. These regulations specify the measures to be used for excavation and trench work where workers could be exposed to unstable soil conditions. The proposed Project would be required to employ these safety measures during excavation and trenching.

California Environmental Quality Act

The CEQA Guidelines require that all private and public activities not specifically exempted be evaluated against the potential for environmental damage, including effects to paleontological resources. Paleontological resources, which are limited, nonrenewable resources of scientific, cultural, and educational value, are recognized as part of the environment under these State guidelines. This study satisfies Project requirements in accordance with CEQA (13 PRC Section 2100 et seq.) and PRC Section 5097.5 (Stats 1965: 2792).

Paleontological resources are explicitly afforded protection by CEQA, specifically in Section VII(f) of CEQA Guidelines Appendix G, the "Environmental Checklist Form," which addresses the potential for adverse impacts to "unique paleontological resource[s] or site[s] or … unique geological feature[s]." This provision covers fossils of signal importance – remains of species or genera new to science, for example, or fossils exhibiting features not previously recognized for a given animal group – as well as localities that yield fossils significant in their abundance, diversity, preservation, and so forth. Further, CEQA provides that generally, a resource shall be considered "historically significant" if it has yielded or may be likely to yield information important in prehistory [PRC Section 15064.5(a)(3)(D)]. Paleontological resources would fall within this category. PRC Sections 5097.5 and 30244 also regulate removal of paleontological resources from State lands, define unauthorized removal of fossil resources as a misdemeanor, and require mitigation of disturbed sites.

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California Health and Safety Code

Sections 17922 and 17951-17958.7 of the California Health and Safety Code require cities and counties to adopt and enforce the current edition of the CBC, including a grading section. Sections of Volume II of the CBC specifically apply to select geologic hazards.

California Occupational Safety and Health Administration Regulations

In California, Cal/OSHA has responsibility for implementing federal rules relevant to worker safety, including slope protection during construction excavations. Cal/OSHA's requirements are more restrictive and protective than federal OSHA standards. 8 CCR Chapter 4, Division of Industrial Safety, covers requirements for excavation and trenching operations, as well as safety standards, whenever employment exists in connection with the construction, alteration, painting, repairing, construction, maintenance, renovation, removal, or wrecking of any fixed structure or its part.

Environmental Determination:

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Impact: Less than Significant Impact

A significant impact would occur if the proposed Project would cause personal injury or death or result in property damage as a result of a fault rupture occurring on the Project site and if the Project site is located within a State-designated Alquist-Priolo Fault Zone or other designated fault zone. According to the California Earthquake Hazards Zone Application (EQ Zapp), the northeast section of the Project site is not located within a designated Alquist-Priolo Earthquake Fault Zone (CGS 2022). However, the southwest section of the Project site has been evaluated in conjunction with the remainder of the parcel that lies in part, along the Casa Loma fault line, the closest known active fault. The corresponding fault zone, San Jacinto Fault Zone, is located approximately 2,360 feet (720 meters) from the southwestern corner of the Project site, the closest point. Wherever an active fault exists, if it has the potential for surface rupture, a structure for human occupancy cannot be placed over the fault and must be a minimum distance from the fault (generally fifty feet). Therefore, impacts would be less than significant (Figure X-1).

In order to minimize the damage caused by earthquakes or faults, earthquake reinforcement can be done on the proposed houses at the project site. According to the recommendation of the soil engineer, the foundation of the house will use concrete slab. Adding additional anchors to fix the house can significantly increase its earthquake resistance performance.

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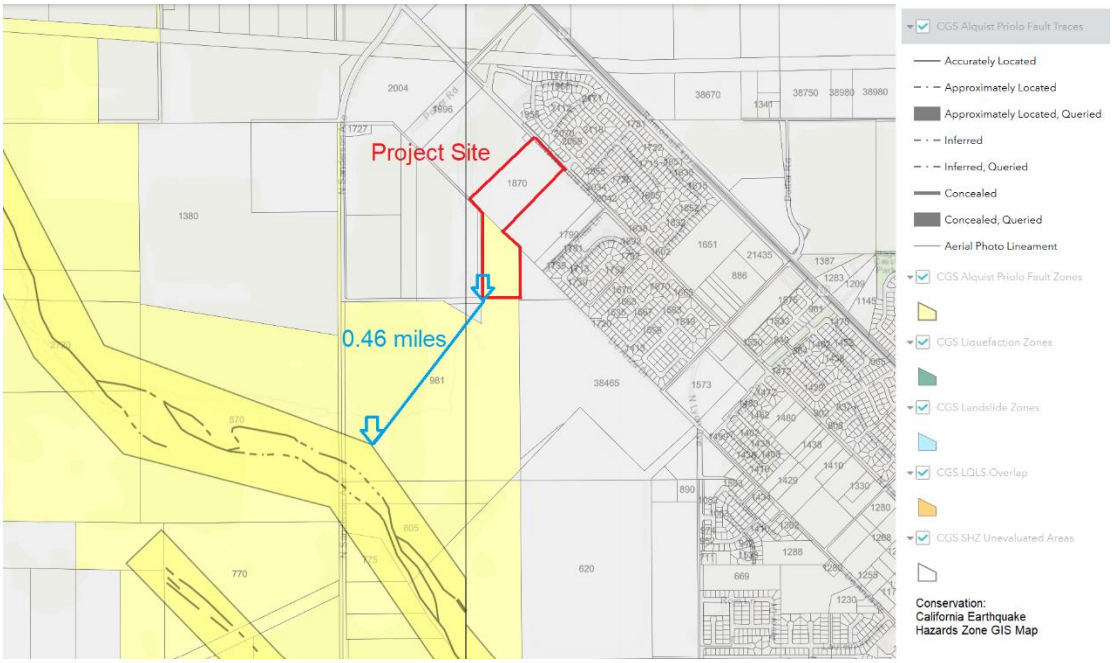

Source: https://maps.conservation.ca.gov/cgs/EQZApp/app/

ii. Strong seismic ground shaking?

Impact: Less Than Significant with Mitigation Incorporated

A significant impact would occur if the proposed Project would cause personal injury or death or result in property damage as a result of seismic ground shaking. The Project site is located in Southern California, a region identified as seismically active. The Casa Loma Fault Zone is located approximately 2,360 feet southeast of the Project site. Thus, moderate to strong ground shaking can be expected at the site.

Structures built in the City are required to be built in compliance with the CBC (24 CCR Part 2), included in the Municipal Code as Section 15.24 Earthquake Hazard Reduction Code. Prior to issuance of construction permits, the Project will demonstrate compliance with the CBC, which would include the incorporation of

1. seismic safety features to minimize the potential for significant effects as a result of earthquakes.
2. Proper building footings and foundations;
3. Construction of the building structures so that they would withstand the effects of strong ground shaking. Because the proposed Project would be constructed in compliance with the CBC, the proposed Project would result in a less than significant impact related to strong seismic ground shaking.

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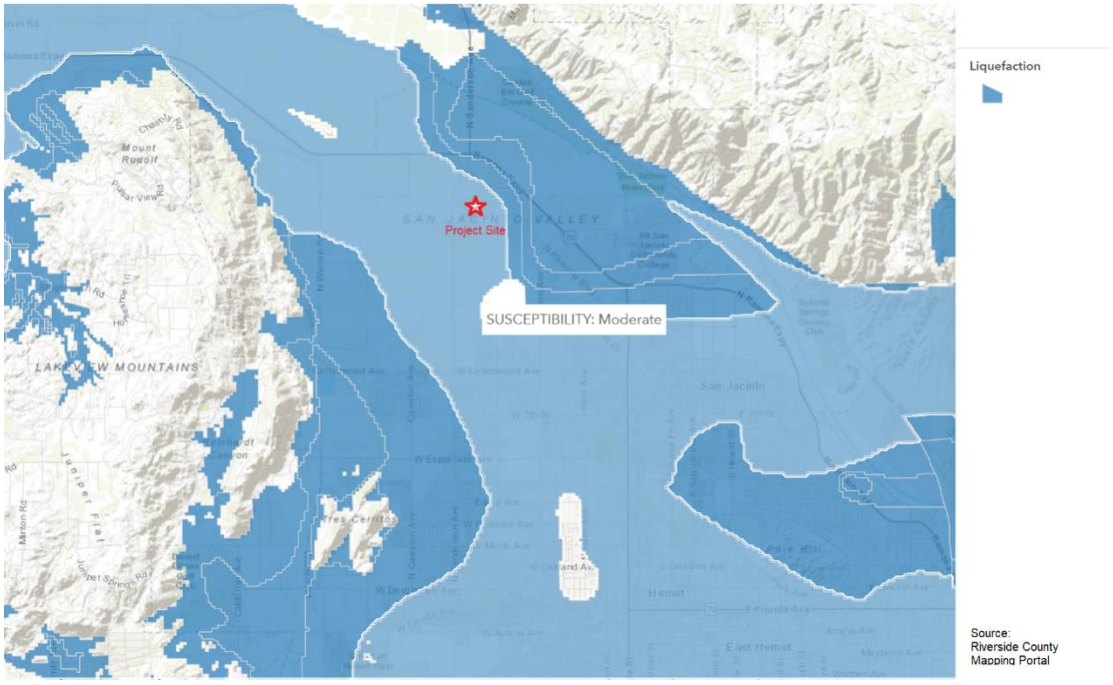
iii. Seismic-related ground failure, including liquefaction?

Impact: Less Than Significant.

The County of Riverside has designated the site as possessing a moderate liquefaction potential. Perched water was observed a depth of about 29.5 feet below grade, Moderate liquefaction potential means that there is a probability of between 10% and 50% of having an earthquake within a 100-year period that will be strong enough to cause liquefaction. Since the site is located in the Moderate liquefaction potential area, proper foundation design can help reduce the hazards caused by soil liquefaction.



Source:https://gisopendata-countyofriverside.opendata.arcgis.com/datasets/8b4d6c0ed6154902b03be41faebdf588/explore?location=33.790652%2C-116.993953%2C12.96

Based on soil engineer's analysis, when an earthquake occurs a worst-case seismic settlement of about 1.9 inches should be assumed. A seismic differential settlement of about 1 inch over a 30-foot span is also considered possible. Based on these results, it is Our opinion that ground modification or special foundation design is not warranted.

Source: GEOTECHNICAL AND INFILTRATION EVALUATION

Estimated seismically induced total settlement		
CPT sounding	Dry settlement (in)*	Total seismic settlement (in)**
1	0.37	0.52
2	1.2	1.15
3	1.28	1.10

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4	1.52	1.83
5	1.25	1.60

*Based on groundwater at 80 feet below grade

**Based on groundwater at 29 feet grade

Based on this analysis a worst-case seismic settlement of about 1.9 inches should be assumed. A seismic differential settlement of about 1 inch over a 30-foot span is also considered possible. Based on these results, it is our opinion that ground modification or special foundation design is not warranted. The results of the seismic settlement analyses are presented within Appendix D.

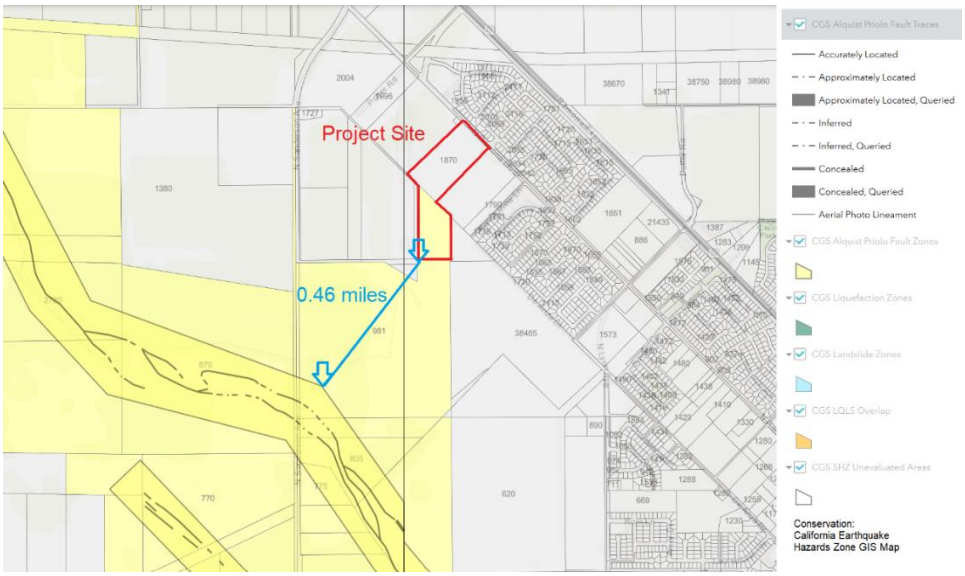
iv. Landslides?

Impact: No Impact

A significant impact would occur if the proposed Project would be implemented on a site that was located in a hillside area with unstable geological conditions or soil types that would be susceptible to failure when saturated. According to the California Department of Conservation Division of Mines and Geology, the Seismic Hazard Zones Map (EQ zapp) The Project site is not located within a landslide hazard zone.

In the GEOTECHNICAL AND INFILTRATION EVALUATION report for the project site. "Evidence of ancient landslides or slope instabilities at this site was not observed during our site reconnaissance. Thus, the potential for landslides is considered negligible for design purposes."

Therefore, the proposed Project would not expose people or structures to potential effects resulting from landslides, no impacts would occur, and no mitigation would be required.



b) Result in substantial soil erosion or the loss of topsoil?

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Impact: Less Than Significant with Mitigation Incorporated

Alluvial deposits were encountered at the ground surface within all explorations at the site and extended to the maximum depths explored. The alluvium generally consisted of loose to medium-dense silty according to GEOTECHNICAL AND INFILTRATION EVALUATION. sand, clayey sand and sand and a stiff to very stiff sandy to clayey silt.

Sandy soils have larger particle sizes and low cohesion, which means they have poor binding capacity. As a result, they are more susceptible to erosion by wind and water. Silty soils have smaller particle sizes than sandy soils, but they can still be prone to erosion. When saturated, silty soils become easily compacted and have reduced permeability, leading to surface crusting. This crusting can hinder water infiltration and increase the risk of erosion.

Construction of the proposed Project would result in a ground surface disturbance during site clearance, excavation, and grading, which could create the potential for soil erosion to occur. Construction activities would be performed in accordance with all applicable regulations. Project construction would comply with all BMPs detailed in a Project-specific Storm Water Pollution Prevention Plan (SWPPP) and reduce any risks related to soil erosion. Therefore, if effective mitigation measures are taken, the proposed project will not cause serious soil erosion or topsoil erosion.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Impact: Less than Significant Impact

Referring to our previous discussion, The Project is located near a geologic unit Casa Loma/Jacinto fault, but due to the long distance (0.46 miles>50 ft), proper seismic design will not have a large impact thus no reasonable probability that the Project could potentially result in an on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. While the Project site's liquefaction potential is moderate, the Project site is not in proximity to any nearby waterbodies, and no construction of any buildings that could exacerbate existing soil conditions is proposed. Subsidence is the sinking or caving of an area of land. Subsidence can be caused by soil movement, water erosion, landslides, mining, vegetation by soil shrinkage, and mining. Subsidence could result in the collapse of the soil. The Project will implement BMPs as outlined in the SWPPP to minimize soil erosion. In addition, the Project will implement the design and construction Recommendations provided in the Geotechnical Design Review and Recommendations report prepared for the Project. The Project does not include any development of structures that could cause the soil to become unstable. Due to the Project site's location, and with the implementation of the construction and design recommendations, BMPs and the City's Grading and Subdivision Codes, the Project will have a less than significant impact directly, indirectly, and cumulatively to on- or offsite landslide, lateral spreading, substance, liquefaction, or collapse. No mitigation is required.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

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Impact: No Impact

A significant impact would occur if the proposed Project would be built on expansive soils without proper site preparation or design features to provide adequate foundations for project buildings, thus posing a hazard to life and property. Expansive soils have relatively high clay mineral and expand with the addition of water and shrink when dried, which can cause damage to overlying structures. Soils on the Project site may have the potential to shrink and swell resulting from changes in the moisture content. According to the soil report "the near surface soils have a "very low" expansion potential (EI=0) when tested and classified in accordance with ASTM D 4829." Therefore, no impact would result, and no mitigation would be required

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

Impact: No Impact

A project would cause a significant impact if adequate wastewater disposal were unavailable. The Project site is located in an area serviced by existing wastewater infrastructure. Connections to main wastewater lines will be constructed during Project construction and would not use septic tanks or alternative wastewater disposal systems. Therefore, no impact would occur, and no mitigation would be required.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?

Impact: Less than Significant Impact with Mitigation Incorporated

A significant impact could occur if grading or excavation activities associated with the Project were to disturb unique paleontological resources or unique geologic features that presently exist within the Project site. The Project site is not known to contain any unique paleontological resource or site or unique geologic feature. Figure RM-4 Cultural Resources of the General Plan does not identify the site as a location containing prehistoric/historical archaeological resources. According to the Archaeological investigation report "The results of the field study were also negative. No prehistoric resources of any kind were identified during the course of the investigation." "The partial records search also failed to identify any historic resources within the project boundaries. No historic resources were discovered during the course of the field study." In the event of a paleontological discovery during Project construction, disturbing activities within 50 feet would be ceased for a paleontological examination. Thus, potential paleontological or geologic impacts of the Project would be less than significant with Mitigation Incorporated.

Mitigation Measures:

None required.

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4.3.8 Greenhouse Gas Emissions

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. Greenhouse Gas Emissions. Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☑	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☑	☐

Appendix A contains the October 13, 2021, Yorke technical report with details of the interrelated air quality, greenhouse gas, noise, and energy studies.

Environmental Determination:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Impact: Less Than Significant Impact

GHGs – primarily CO_2, methane (CH_4), and nitrous oxide (N_2O), collectively reported as carbon dioxide equivalents (CO_2e) – are directly emitted from stationary source combustion of natural gas in equipment such as water heaters, boilers, process heaters, and furnaces. GHGs are also emitted from mobile sources such as on road vehicles and offroad construction equipment burning fuels such as gasoline, diesel, biodiesel, propane, or natural gas (compressed or liquefied). Indirect GHG emissions result from electric power generated elsewhere (i.e., power plants) used to operate process equipment, lighting, and utilities at a facility. Also included in GHG quantification is electric power used to pump the water supply (e.g., aqueducts, wells, pipelines) and disposal and decomposition of municipal waste in landfills (CARB 2017).

California's Building Energy Efficiency Standards are updated on an approximately 3-year cycle. The 2019 standards improved upon the 2016 standards for new construction of, and additions and alterations to, residential, commercial, and industrial buildings. The 2019 standards went into effect on January 1, 2020 (CEC 2019).

Since the Title 24 standards require energy conservation features in new construction (e.g., high-efficiency lighting, high-efficiency HVAC systems, thermal insulation, double-glazed windows, water conserving plumbing fixtures, etc.), they indirectly regulate and reduce GHG emissions.

Using CalEEMod, direct on-site and off-site GHG emissions were estimated for construction and operation, and indirect off-site GHG emissions were estimated to account

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for electric power used by the proposed Project, water conveyance, and solid waste disposal.

The SCAQMD officially adopted an industrial facility mass emissions threshold of 10,000 MT CO_2e per year (SCAQMD 2019) and has proposed a draft residential/commercial mass emissions threshold of 3,000 MT CO_2e per year (SCAQMD 2008b).

Table 4-8 shows unmitigated and mitigated GHG emissions and evaluates mitigated emissions against SCAQMD significance thresholds. Operational measures incorporate typical code-required energy and water conservation features. Off-site traffic impacts are included in these emissions estimates, along with construction emissions amortized over 30 years.

As shown in Table 4-8, mitigated GHG emissions are below the proposed GHG significance threshold for land use projects. Thus, impacts would be less than significant.

Table 4-8: Greenhouse Gas Emissions Summary and Significance Evaluation

Greenhouse Gases	Unmitigated (MT/yr)	Mitigated (MT/yr)	Threshold (MT/yr)	Significance
CO_2	2,594	2,545	–	–
CH_4	3.1	1.7	–	–
N_2O	0.1	0.1	–	–
CO_2e	2,704	2,621	3,000	LTS

Sources: SCAQMD 2008b, CalEEMod version 2020.4.0.

Notes:

Comprises annual operational emissions plus construction emissions amortized over 30 years

LTS – Less Than Significant

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Impact: Less Than Significant Impact

The California legislature passed Senate Bill (SB) 375 to connect regional transportation planning to land use decisions made at a local level. SB 375 requires the metropolitan planning organizations to prepare a Sustainable Communities Strategy (SCS) in their regional transportation plans to achieve the per capita GHG reduction targets. For the SCAG region, the SCS is contained in the 2012-2035 RTP/SCS. The 2012-2035 RTP/SCS focuses the majority of new housing and job growth in high-quality transit areas and other opportunity areas on existing main streets, downtowns, and commercial corridors, resulting in an improved jobs-housing balance and more opportunity for transit-oriented development. In addition, SB 743, adopted September 27, 2013, encourages land use and transportation planning decisions and investments that reduce vehicle miles traveled that contribute to GHG emissions, as required by Assembly Bill (AB) 32. The proposed Project consists of construction, use, and maintenance of 206 single-family residences on a land zoned as residential in an incorporated suburban area. The proposed Project would not interfere with SCAG's ability to implement the regional strategies outlined in the

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2012-2035 RTP/SCS. As such, impacts would be less than significant, and no mitigation is required.

Mitigation Measures:

None required.

4.3.9 Hazards and Hazardous Materials

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. Hazards and Hazardous Materials. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☑
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☑	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☑
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☑
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☑

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Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☑	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☑

Environmental Determination:

a) Create significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Impact: No Impact

A significant impact would occur if the proposed Project would create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Construction of the proposed Project would involve transport, use, and disposal of hazardous materials including paints, solvents, oils, grease, and caulking. However, construction activities are short-term in nature and impacts would therefore be less than significant.

Operation of the proposed Project would require routine maintenance involving transport, use, or disposal of hazardous materials (fuels, lubricant for machinery, paint and other coating materials, etc.). However, no industrial uses or activities are proposed that would result in the use or discharge of unregulated hazardous materials and/or substances, or create a public hazard through transport, use, or disposal. With regard to airborne hazards, the Project will comply with all applicable rules of the SCAQMD that regulate air contaminants.

The transport, use, storage, and disposal of hazardous materials would be relatively minor and subject to existing regulations, so the impact is considered less than significant. Use of common household hazardous materials and their disposal does not present a substantial risk to the community. Therefore, it is No Impact associated with the routine transport and use of hazardous materials or wastes will be less than significant. No mitigation is required.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Impact: Less Than Significant Impact

During construction, some contractor activities could create a hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, e.g., small fuel spills. A SWPPP is

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required by the National Pollutant Discharge Elimination System (NPDES) General Construction Permit and would require the implementation of BMPs during construction. This will ensure the proper use, storage, transport, and disposal of hazardous materials during construction in accordance with applicable regulations, which would not pose significant impacts. A SWPPP for the proposed Project will be prepared once the entitlement package has been approved by the City, while the final engineering plans are being prepared.

Once in operation, the proposed Project will involve limited common household hazardous materials, including paints, solvents, cleaning products, fuels, lubricants, adhesives, sealers, and pesticides/herbicides. These hazardous materials are subject to existing consumer product regulations that reduce associated risks and impacts to a safe level for household use that would not result in any significant impacts. Therefore, impacts on hazards to the public or environment from reasonably foreseeable upset or accident conditions would be less than significant.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Impact: No Impact

The nearest school is approximately 1.5 miles southeast of the proposed Project. There are no schools proposed within one-quarter mile of the proposed Project. Therefore, this Project will have no impact on schools with regards to hazardous materials, substances, or waste.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code 65962.5 and as a result, would it create a significant hazard to the public or the environment?

Impact: No Impact

A significant impact would occur if the Project site were included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and would create a significant hazard to the public or the environment. The California Department of Toxic Substances Control (DTSC) maintains a database (EnviroStor) that provides access to detailed information on hazardous waste permitted sites and corrective action facilities, as well as existing site cleanup information. EnviroStor also provides information on investigation, cleanup, permitting, and/or corrective actions that are planned, being conducted, or have been completed under the DTSC's oversight. A review of EnviroStor did not identify any records of hazardous waste facilities on the Project site. Therefore, the proposed Project is not located on a site that is included on a list of hazardous materials sites and would not create a significant hazard to the public or the environment, and no impact would occur.

e) For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

Impact: No Impact

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The proposed Project is located more than 2 miles from a public airport or public use airport and is not located within any airport land use plans. The nearest airport is the Hemet-Ryan Airport, located approximately 5 miles southwest of the proposed Project. Therefore, no impacts regarding safety hazards or excessive noise for people residing or working in the Project area would occur.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Impact: Less than Significant Impact

The proposed Project would not require the closure of any public or private streets and would not impede emergency vehicle access to the Project site or surrounding area. Additionally, emergency access to and from the Project site would be provided in accordance with requirements of the Riverside County Fire Department (RCFD). Therefore, the proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan, no impact would occur, and no mitigation would be required.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Impact: No Impact

The Project site has been used for agriculture and is within an area that is used for farming, residential, school, fire station, and commercial uses. The Project site is not adjacent to any wildland areas. According to the Cal FIRE Hazard Severity Zone map, the Project site is not within a high fire hazard zone (Cal FIRE 2022). As a result, the proposed Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

Mitigation Measures:

None required.

4.3.10 Hydrology and Water Quality

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
X. Hydrology and Water Quality. Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☑	☐

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Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☑	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☑	☐
i) result in a substantial erosion or siltation on- or off-site;				
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;				
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or				
iv) impede or redirect flood flows?				
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☑
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☑	☐

Summary:

Construction of the proposed project will add impervious area Two proposed on-site storm drain systems will be constructed to convey the runoff produced by the proposed development project. Two on-site storm water quality bioretention basins will be constructed to capture and biologically treat storm water runoff. Regulatory Setting:

Federal

Clean Water Act

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Increasing public awareness and concern for controlling water pollution led to the enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the Clean Water Act (CWA) (33 U.S. Code Section 1251 et seq.). The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The CWA established basic guidelines for regulating discharges of pollutants into waters of the United States. The CWA requires that states adopt water quality standards to protect public health, enhance the quality of water resources, and ensure implementation of the CWA.

Section 303 of the Clean Water Act (Beneficial Use and Water Quality Objectives)

The Santa Ana Regional Water Quality Control Board (RWQCB) is responsible for the protection of the beneficial uses of waters within the proposed Project area in Riverside County. The RWQCB uses its planning, permitting, and enforcement authority to meet its responsibilities adopted in the Basin Plan to implement plans, policies, and provisions for water quality management.

In accordance with State policy for water quality control, the RWQCB employs a range of beneficial use definitions for surface waters, groundwater basins, marshes, and mudflats that serve as the basis for establishing water quality objectives and discharge conditions and prohibitions. The Basin Plan for the Central Coast Region has identified existing and potential beneficial uses supported by the key surface water drainages throughout its jurisdiction. Under CWA Section 303(d), the State of California is required to develop a list of impaired water bodies that do not meet water quality standards and objectives. A Total Maximum Daily Load (TMDL) defines how much of a specific pollutant/stressor a given water body can tolerate and still meet relevant water quality standards. The RWQCB has developed TMDLs for select reaches of water bodies.

Section 401 of the Clean Water Act (Water Quality Certification)

Section 401 of the CWA requires that an applicant for any federal permit (e.g., a U.S. Army Corps of Engineers Section 404 permit) obtain certification from the State, requiring discharge to waters of the United States to comply with provisions of the CWA and with State water quality standards. For example, an applicant for a permit under Section 404 of the CWA must also obtain water quality certification per Section 401 of the CWA. Section 404 of the CWA requires a permit from the U.S. Army Corps of Engineers prior to discharging dredged or fill material into waters of the United States unless such a discharge is exempt from CWA Section 404. For the Project area, the Santa Ana RWQCB provides the water quality certification required under Section 401 of the CWA.

Section 402 of the Clean Water Act (NPDES)

The CWA was amended in 1972 to provide that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with an NPDES permit. The NPDES permit program, as authorized by Section 402 of the CWA, was established to control water pollution by regulating point sources that discharge pollutants into waters of the United States (33 U.S. Code Section 1342). In California, the United States Environmental Protection Agency (U.S. EPA) has authorized the State Water Resources Control Board (SWRCB) permitting authority to implement the NPDES program.

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The Phase II Rule that became final on December 8, 1999, expanded the existing NPDES Program to address storm water discharges from construction sites that disturb land equal to or greater than 1 acre and less than 5 acres (small construction activity). The regulations also require that storm water discharges from small municipal separate storm sewer systems (MS4s) be regulated by an NPDES General Permit for Storm Water Discharges Associated with Construction Activity, Order No. 99-08-DWQ (i.e., the Construction General Permit). Based on this document, it is the responsibility of applicants to obtain coverage under the Construction General Permit and develop a SWPPP, which describes BMPs the discharger would use to protect storm water runoff. The BMPs must be designed to prevent, to the maximum extent practicable, an increase in the sediment yield and flow velocity from pre-construction/pre-development conditions, to ensure that applicable water quality standards, including TMDL waste allocations, are met.

The SWPPP must contain a visual monitoring program, a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs, and a sediment monitoring plan if the site discharges directly to a water body listed on the Section 303(d) list for sediment. Routine inspection of all BMPs is required under the provisions of the Construction General Permit. On September 2, 2009, the SWRCB issued a new NPDES General Permit for Storm Water Associated with Construction Activities (Order No. 2009-0009-DWQ, NPDES No. CAS000002), which became effective July 1, 2010.

National Flood Insurance Program

The National Flood Insurance Act of 1968 established the National Flood Insurance Program in order to provide flood insurance within communities that were willing to adopt floodplain management programs to mitigate future flood losses. The Act also required the identification of all floodplain areas within the United States and the establishment of flood risk zones within those areas. The Federal Emergency Management Agency (FEMA) is the primary agency responsible for administering programs and coordinating with communities to establish effective floodplain management standards. FEMA is responsible for preparing Flood Insurance Rate Maps that delineate the areas of known special flood hazards and their risk to the community. The program encourages the adoption and enforcement by local communities of floodplain management ordinances that reduce flood risks. In support of the program, FEMA identifies flood hazard areas throughout the United States on FEMA flood hazard boundary maps.

Federal Antidegradation Policy

The Federal Antidegradation Policy (40 CFR Part 131.12) requires states to develop statewide antidegradation policies and identify methods for implementing them. Pursuant to this regulation, state antidegradation policies and implementation methods shall, at a minimum, protect and maintain: (1) existing in-stream water uses; (2) existing water quality where the quality of the waters exceeds levels necessary to support existing beneficial uses, unless the state finds that allowing lower water quality is necessary to accommodate economic and social development in the area; and (3) water quality in waters considered an outstanding national resource.

State

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Senate Bill 610 and Senate Bill 221: Water Supply Assessments and Water Supply Verifications

SB 610 and SB 221, effective January 1, 2002, improve the linkage between certain land use decisions made by cities and counties and water supply availability. Under Water Code Section 10912(a), projects subject to CEQA requiring a water supply assessment include a residential development of more than 500 dwelling units; a shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space; a commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space; a hotel, motel, or both having more than 500 rooms; an industrial, manufacturing, or processing plant or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land or having more than 650,000 square feet of floor area; a mixed-use project that includes one or more of the projects specified; or a project that would demand an amount of water equivalent to or greater than the amount required by a 500 dwelling unit project. A fundamental source document for compliance with SB 610 is the Urban Water Management Plan, which can be used by the water supplier to meet the standard for SB 610.

Sustainable Groundwater Management Act

On September 16, 2014, Governor Jerry Brown signed into law a three-bill legislative package – AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley) – collectively known as the Sustainable Groundwater Management Act (SGMA), which requires governments and water agencies of high- and medium-priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. Under the SGMA, these basins should reach sustainability within 20 years of implementing their sustainability plans. For critically over-drafted basins, sustainability should be achieved by 2040. For the remaining high- and medium-priority basins, 2042 is the deadline. Through the SGMA, the California Department of Water Resources (DWR) provides ongoing support to local agencies through guidance, financial assistance, and technical assistance. The SGMA empowers local agencies to form Groundwater Sustainability Agencies to manage basins sustainably and requires Groundwater Sustainability Plans to be completed for crucial (i.e., medium- to high-priority) groundwater basins in California. Adjudicated basins are exempt from developing a Groundwater Sustainability Agency or Groundwater Sustainability Plan.

California Porter-Cologne Water Quality Control Act

Since 1973, the California SWRCB and its nine RWQCBs have been delegated the responsibility for administering permitted discharge into the waters of California. The Project site falls within the jurisdiction of the Central Coast RWQCB. The Porter-Cologne Water Quality Act (California Water Code Section 13000 et seq.; 23 CCR Division 3, Chapter 15) provides a comprehensive water quality management system for the protection of California waters. Under the Act, "any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state" must file a report of the discharge with the appropriate RWQCB. Pursuant to the Act, the RWQCB may then prescribe "waste discharge requirements" that add conditions related to control of the discharge. Porter-Cologne defines "waste" broadly, and the term has been applied to a diverse array of materials, including non-point source pollution. When

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regulating discharges that are included in the federal Clean Water Act, the State essentially treats Waste Discharge Requirements and NPDES permits as a single permitting vehicle. In April 1991, the SWRCB and other State environmental agencies were incorporated into the California Environmental Protection Agency.

The RWQCB regulates urban runoff discharges under the NPDES permit regulations. NPDES permitting requirements cover runoff discharged from point (e.g., industrial outfall discharges) and non-point (e.g., storm water runoff) sources. The RWQCB implements the NPDES program by issuing construction and industrial discharge permits.

Under the NPDES permit regulations, BMPs are required as part of a SWPPP. The U.S. EPA defines BMPs as "schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of Waters of the United States." BMPs include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage" (40 CFR Part 122.2).

CALGreen

Formerly known as the California Green Building Standards Code, 24 CCR Part 11, CALGreen is designed to improve public health, safety, and general welfare by using design and construction methods that reduce the negative environmental impact of development and to encourage sustainable construction practices. CALGreen provides mandatory direction to developers of all new construction and renovations of residential and non-residential structures with regard to all aspects of design and construction, including, but not limited to, site drainage design, storm water management, and water use efficiency. Required measures are accompanied by a set of voluntary standards designed to encourage developers and local agencies to aim for a higher standard of development.

California Antidegradation Policy

The California Antidegradation Policy, otherwise known as the Statement of Policy with Respect to Maintaining High-Quality Water in California, was adopted by the SWRCB (State Board Resolution No. 68-16) in 1968. Unlike the Federal Antidegradation Policy, the California Antidegradation Policy applies to all waters of the State (e.g., isolated wetlands and groundwater), not just surface waters. The policy states that whenever the existing quality of a water body is better than the quality established in individual Basin Plans, such high quality shall be maintained, and discharges to that water body shall not unreasonably affect present or anticipated beneficial use of such water resource.

California Toxics Rule

The U.S. EPA has established water quality criteria for certain toxic substances via the California Toxics Rule. The California Toxics Rule established acute (i.e., short-term) and chronic (i.e., long-term) standards for bodies of water such as inland surface waters and enclosed bays and estuaries that are designated by each RWQCB as having beneficial uses protective of aquatic life or human health.

California Water Code

The California Water Code includes 22 kinds of districts or local agencies with specific statutory provisions to manage surface water. Many of these agencies have statutory

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authority to exercise some forms of groundwater management. For example, a Water Replenishment District (Water Code Section 60000 et seq.) is authorized to establish groundwater replenishment programs and collect fees for that service, while a Water Conservation District (Water Code Section 75500 et seq.) can levy groundwater extraction fees. Through special acts of the Legislature, 13 local agencies have been granted greater authority to manage groundwater. Most of these agencies, formed since 1980, have the authority to limit export and control some in-basin extraction upon evidence of overdraft or the threat of an overdraft condition. These agencies can also generally levy fees for groundwater management activities and for water supply replenishment.

Assembly Bill 3030 – Groundwater Management Act

In 1992, AB 3030 was passed, which increased the number of local agencies authorized to develop a groundwater management plan and set forth a common framework for management by local agencies throughout California. These agencies could possess the same authority as a water replenishment district to "fix and collect fees and assessments for groundwater management" (Water Code Section 10754), provided they receive a majority of votes in favor of the proposal in a local election (Water Code Section 10754.3).

Local

Santa Ana Regional MS4 Permit

Santa Ana Regional MS4 Permit regulations are included in the City's Municipal Code in Chapter 13.44. The MS4 Permit:

- Provides the framework for the program management activities and plan development;
- Provides the legal authority for prohibiting unpermitted discharges into the storm drain system and for requiring BMPs in new development and significant redevelopment;
- Ensures that all new development and significant redevelopment incorporates appropriate Site Design, Source Control, and Treatment Control BMPs to address specific water quality issues; and
- Ensures that construction sites implement control practices that address construction-related pollutants, including erosion and sediment control and onsite hazardous materials and waste management.

The Santa Ana Regional MS4 Permit requires that new development and significant redevelopment projects (or priority projects), such as the proposed Project, develop and implement a WQMP that includes BMPs and Low Impact Development (LID) design features that would provide on-site treatment of stormwater to prevent pollutants from on-site uses from leaving the site.

Environmental Determination:

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Impact: Less Than Significant Impact

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A Hydrology & Hydraulic Study (Hydrology Study) was prepared by W&W Land Design Consultants on October 15, 2021, for the proposed Project (Appendix D). Construction of the project will add impermeable cover, which could increase the volume of runoff and increase the risk of localized flooding.

Construction

Implementation of the proposed Project includes grading, site preparation, construction of new buildings, and infrastructure improvements. Grading, stockpiling of materials, excavation, construction of new structures, and landscaping activities would expose and loosen sediment and building materials, which would have the potential to mix with stormwater and urban runoff and degrade surface and receiving water quality.

Additionally, construction generally requires the use of heavy equipment and construction-related materials and chemicals, such as concrete, cement, asphalt, fuels, oils, antifreeze, transmission fluid, grease, solvents, and paints. In the absence of proper controls, such as monitor and improve management disposal, locate materials like sand or cement secure, cover up all drain, keep the road and footpath clean and properly collect and treat any waste water, these potentially harmful materials could be accidentally spilled or improperly disposed of during construction activities and could wash into and pollute surface waters or groundwater, resulting in a significant impact to water quality.

Pollutants of concern during construction activities generally include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. Each of these pollutants on its own or in combination with other pollutants can have a detrimental effect on water quality. In addition, chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), and concrete-related waste may be spilled or leaked during construction, which would have the potential to be transported via storm runoff into nearby receiving waters and eventually may affect surface or groundwater quality. During construction activities, excavated soil would be exposed, thereby increasing the potential for soil erosion and sedimentation to occur compared to existing conditions. In addition, during construction, vehicles and equipment are prone to tracking soil and/or spoil from work areas to paved roadways, which is another form of erosion that could affect water quality.

However, the use of Best Management Practices (BMPs) during construction implemented as part of a Stormwater Pollution Prevention Plan (SWPPP) as required by the National Pollutant Discharge Elimination System (NPDES) Construction General Permit would serve to ensure that Project impacts related to construction activities resulting in a degradation of water quality would be less than significant. A SWPPP for the Proposed Project will be prepared once the entitlement package has been approved while the final engineering plans are being prepared. Furthermore, an Erosion and Sediment Transport Control Plan prepared by a qualified SWPPP developer is required to be included in the SWPPP for the Project and typically includes the following types of erosion control methods that are designed to minimize potential pollutants entering stormwater during construction:

- Prompt revegetation of proposed landscaped areas;
- Perimeter gravel bags or silt fences to prevent off-site transport of sediment;

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- Storm drain inlet protection (filter fabric gravel bags and straw wattles), with gravel bag check dams within paved roadways;
- Regular sprinkling of exposed soils to control dust during construction and soil binders for forecasted windstorms;
- Specifications for construction waste handling and disposal;
- Contained equipment wash-out and vehicle maintenance areas;
- Erosion control measures including soil binders, hydro-mulch, geotextiles, and hydroseeding of disturbed areas ahead of forecasted storms;
- Construction of stabilized construction entry/exits to prevent trucks from tracking sediment on City roadways;
- Construction timing to minimize soil exposure to storm events; and
- Training of subcontractors on general site housekeeping.

Therefore, compliance with the Construction General Permit requirements, which would be verified during the City's construction permitting process, would ensure that Project impacts related to construction activities resulting in a degradation of water quality would be less than significant.

Operation

The proposed Project includes operation of single-family residential. Potential pollutants associated with the proposed uses include various chemicals from cleaners, pathogens from pet wastes, nutrients from fertilizer, pesticides, and sediment from landscaping, trash, and debris, and oil and grease from vehicles. If these pollutants discharge into surface waters, it could result in degradation of water quality.

The proposed Project falls under the jurisdiction of the Santa Ana Regional MS4 Permit, which regulates stormwater runoff from land and building development projects greater than 5,000 square feet. To comply with this permit, new development and significant redevelopment projects must develop and implement a Water Quality Management Plan (WQMP). The WQMP aims to manage stormwater runoff and prevent pollutants from on-site uses from leaving the site.

The preliminary WQMP for the proposed Project has been developed, recommending various Best Management Practices (BMPs) and Low Impact Development (LID) design features. These measures will provide on-site treatment of stormwater, helping to mitigate potential water quality issues resulting from the increase in impervious surface due to the construction.

The WQMP must be approved before the issuance of building or grading permits. As part of the proposed Project, two on-site storm drain systems will be constructed to convey runoff from the increased impervious surfaces. Additionally, two stormwater quality bioretention will treat the first flush of runoff, filtering pollutants through vegetation and soil.

The Hydrology Report confirms that the proposed Project can be constructed without any detrimental effects on surrounding properties. The report assesses the impact of the

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development on the hydrological cycle, including rainfall patterns and stormwater runoff, ensuring that stormwater management measures are effective.

By incorporating these stormwater management strategies and adhering to the Santa Ana Regional MS4 Permit requirements, the proposed Project aims to minimize its impact on water quality and the surrounding environment, benefiting both private and public land development and promoting responsible urban redevelopment practices.

Further the Protection of Riparian/Riverine and Vernal Pool resources have been considered on priority basis as part of the project. Different pre plans and measures have been included toensure the protection of the said biodiversity. There are two vernal pools at a distance of 13 and 16 kilometers with the main riverside bed at 1.6 kilometers from the project site. The river flow has



Figure 7 the figure shows the location of river to the project side which is at about 2 kilometers

no impact from the project as it is located outside the proposed buffer zone of the project site.

Considering the location of the site to the mentioned biodiversity, different mitigation measures are proposed as the site has little impact on the biodiversity. A few mitigation measures are needed and are involved different stakeholders to further protect the biodiversity.

1. Buffer zone establishment. A buffer needs to be defined to protect the riverside and Vernal Pool to protect from encroachments. The project site as mentioned is at about 1.93 kilometers from the riverside and is outside of the buffer zone, which has no impact on thebiodiversity of the riverside.

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The project process is integral to ensuring that development and other land use changes do not result in a net loss of critical habitat functions and that conservation goals are achieved inline with regulatory requirements.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Impact: Less Than Significant Impact

The Eastern Municipal Water District (EMWD) provides water services to the project area. The EMWD's Draft 2020 Urban Water Management Plan (UWMP)(Water Systems Consulting, Inc., 2021) describes that the EMWD relies on a small portion of groundwater from the Hemet/San Jacinto Basin and the West San Jacinto Basin. Water production from these basins is managed through a watermaster and a Groundwater Sustainability Plan, which provide allowable pumping allocations that are sustainable.

EMWD published the 2020 UWMP to address water supply sources, projected demands, and supply reliability for the water district (EMWD 2020). As shown in Table 6-15 of UWMP, reproduced below as Table 4-9, the anticipated production of groundwater would remain the same through 2045, and the use of recycled and imported water would increase through 2045. In 2045, groundwater would provide 17% of the EMWD water supply.

Table 4-9: DWR 6-9R Projected Water Supplies

Water Supply	Additional Detail on Water Supply	Projected Water Supply (AFY) Reasonably Available Volume				
		2025	2030	2035	2040	2045
Purchased or Imported Water	Metropolitan Treated/Untreated	66,447	72,147	70,247	74,747	78,847
Groundwater (not desalinated)	Pumped from the Hemet/San Jacinto Basin	7,303	7,303	7,303	7,303	7,303
Groundwater (not desalinated)	Pumped from the West San Jacinto Basin	11,450	11,450	11,450	11,450	11,450
Desalinated Water – Groundwater	Desalinated water from the West San Jacinto Basin	13,400	13,400	13,400	13,400	13,400
Recycled Water	Excludes Storage Pond Incidental Recharge/Evaporation	43,330	49,020	54,500	59,800	64,100
Other	Purified Water Replenishment (IPR)	4,000	4,000	12,000	12,000	12,000
	TOTAL	**145,930**	**157,320**	**168,900**	**178,700**	**187,100**

The projected recycled water supply total is inclusive of recycled water that is required to be recharged as part of EMWD's planning Purified Water Replenishment (PWR) Program – an indirect Potable Reuse project with multiple phases. This recharge volume is reported under the groundwater recharge line item in Table 6-7 (DWR 6-4R) as a demand/beneficial use of EMWD's recycled water supply. The projected supply total

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under the "other" category reflects the volume of water produced by PWR that will be used to meet demands on EMWD's potable water system.

The supply of water listed in Table 4-9 would be sufficient during both normal years and multiple dry year conditions between 2025 and 2045 to meet all of EMWD's estimated needs, including the proposed Project. Therefore, the proposed Project would not result in changes to the projected groundwater pumping that would decrease groundwater supplies. Thus, impacts related to groundwater supplies would be less than significant.

Construction of the proposed on-site bioretention basins would negate the impacts of an increase in impervious surface of the Project site. Therefore, impacts to groundwater recharge are less than significant.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i. result in a substantial erosion or situation on- or off-site;

ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; and

iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

iv. Impede or redirect flood flows?

Impact: Less than Significant Impact

The project site does not include and is not adjacent to a natural stream or river. Implementation of the proposed Project would not alter the course of a stream or river.

A significant impact would occur if the proposed Project would substantially alter the drainage pattern of the site or area, including through the alteration of the course of a stream or river, such that erosion or siltation would result. The Project site does not contain, nor is adjacent to, any stream or river. Project construction would temporarily expose on-site soils to surface water runoff. However, compliance with construction-related BMPs and/or the SWPPP would control and minimize erosion and siltation. During project operation, storm water or any runoff irrigation waters would be directed into storm drains and into the onsite bioretention basins. Significant alterations to existing drainage patterns within the Project site and surrounding area would not occur. Therefore, the proposed Project would result in less than significant impact related to the alteration of drainage patterns and on- or off-site erosion or siltation and no mitigation is required.

Construction of the proposed Project would require excavation and grading activities that would expose and loosen building materials and sediment, which has the potential to mix with stormwater runoff and result in erosion or siltation off-site. However, the project site does not include any slopes, which reduces the erosion potential, and the large majority of soil disturbance would be related to excavation and backfill for installation of building foundations and underground utilities. Therefore, the proposed Project would result in less

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than significant impacts related to the existing drainage pattern of the site or area, and no mitigation is required.

d) In flood hazard, tsunami or seiche zones, risk release of pollutants due to project inundation?

Impact: No Impact

A significant impact could occur if the project includes potential sources of water pollutants that would have the potential to interfere with a water quality control plan or sustainable groundwater management plan. According to Figure PS-2 Flood Zones of the General Plan, the Project site is not located within a 100 Year Flood or 500 Year Flood zone. Thus, the project site is not located within a flood hazard area that could be inundated with flood flows and result in the release of pollutants. Impacts related to flood hazards and pollutants would not occur from the proposed Project.

In the LOMR dated June 27, 2022, provided as Appendix F, the Federal Insurance and Mitigation Administration's Engineering Services Branch provided a revised Flood Insurance Study Report and Flood Insurance Rate Map that demonstrates the Project site is not located within a flood zone.

Tsunamis are generated ocean wave trains generally caused by the tectonic displacement of the seafloor associated with shallow earthquakes, seafloor landslides, rock falls, and exploding volcanic islands. The proposed Project is approximately 45 miles from the ocean shoreline and shielded by mountains. Based on the distance of the Project site to the Pacific Ocean, the project site is not at risk of inundation from a tsunami. Therefore, the proposed Project would not risk the release of pollutants from inundation from a tsunami. No impact would occur, and no mitigation is required.

Seiche is a phenomenon that occurs when seismic ground shaking induces standing waves (seiches) inside water retention facilities (e.g., reservoirs and lakes). Such waves can cause retention structures to fail and flood downstream properties. The Project site is not located near any lake or reservoir that could generate a seiche. For this reason, the project site is not at risk of inundation from seiche waves. Therefore, the proposed Project would not risk the release of pollutants from inundation from seiche. No impact would occur, and no mitigation is required.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Impact: Less Than Significant Impact

Implementation of BMPs during construction as part of a SWPPP would ensure that Project impacts related to construction activities resulting in a degradation of water quality would be less than significant. Thus, construction of the Project would not conflict with or obstruct implementation of a water quality control plan. Therefore, the project conforms Goal RM 2 Water Resources, RM-2a in the City's General Plan.

All new development projects are required to implement a WQMP that would comply with the MS4 permit requirements. The WQMP and applicable BMPs are verified as part of the City's permitting approval process, and construction plans would be required to

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demonstrate compliance with these regulations. Therefore, operation of the proposed Project would not conflict with or obstruct implementation of a water quality control plan.

As stated in Part b) of this section, EMWD's supply of groundwater would be sufficient during both normal years and multiple dry conditions between 2025 and 2045 to meet all of the City's estimated needs, including the proposed Project. Therefore, the proposed Project would be consistent with the groundwater management plan and would not conflict with or obstruct its implementation. Thus, impacts related to water quality control plans or sustainable groundwater management plans would be less than significant.

Mitigation Measures:

None required.

4.3.11 Land Use and Planning

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. Land Use and Planning. Would the project:				
a) Physically divide an established community?	☐	☐	☐	☑
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☑

Environmental Determination:

a) Physically divide an established community?

Impact: No Impact

The Project site was historically used for farming purposes and has been designated for residential development by the City's General Plan and zoning map. The site is adjacent to two separate residential developments and vacant land. The proposed Project would develop the site to provide 206 single-family residential units, consistent with the existing single-family residences surrounding the site. Therefore, developing the vacant site into a residential neighborhood would not physically divide an established community. In addition, the Project would not change roadways or pedestrian bridges or install any infrastructure that would result in physical barriers to accessibility. Thus, the proposed Project would not result in impacts related to the physical division of an established community.

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Impact: No Impact

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According to Goal M-3-Complete Streets of mobility chapter at San Jacinto General Plan as New Development. Encourage Specific Plans and Planned Developments to include well-developed and funded multimodal transportation facilities, at the project it has to Develop and maintain complete streets design guidance based on these resources and other best practices. The proposed Project is consistent with all applicable land use plans, policies, and regulations and would have no impact in this regard.

Mitigation Measures:

None required.

4.3.12 Mineral Resources

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. Mineral Resources. Would the project:				
a) Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?	☐	☐	☐	☑
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☑

Environmental Determination:

a) Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?

Impact: No Impact

The General Plan EIR states that the City is located within a Mineral Resource Zone 1 by the California Geological Survey, meaning that the site is in an area for which geologic information indicates no significant mineral deposits are present. In addition, the Project site and surrounding areas do not include existing or pervious mining uses. Thus, implementation of the proposed Project would not result in the loss of availability of a known mineral resource that would be of value to the region or the residents of the State, and there would be no impacts.

Geological, geochemical and geophysical evidence by California Geological Survey, in review of historical prospecting and survey suggests that San Jacinto has low potential for all kind of mineral resources or geothermal energy.

Based on these evidence San Jacinto has been ranked on Zone 1, and has low potential for mineral resources and executing the project will have no effect on the community or resources.

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b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Impact: No Impact

The City of San Jacinto General Plan EIR states that the City is located within a designated Mineral Resource Zone 1 by the California Geological Survey, meaning that the site is in an area for which geologic information indicates no significant mineral deposits are present. As described in part a), the Project site and surrounding areas do not contain known mineral resources. Therefore, no impacts related to the loss of availability of a locally important mineral resource recovery site, as delineated on a local general plan, specific plan, or other land use plan, would occur as a result of the Project.

Mitigation Measures:

None required.

4.3.13 Noise

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. Noise. Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☑	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑

Appendix A contains the October 13, 2021, Yorke technical report with details of the interrelated air quality, greenhouse gas, noise, and energy studies.

Methodology:

The screening-level noise analysis for Project construction was completed based on methodology developed by the United States Department of Transportation (U.S. DOT) Federal Highway Administration (FHWA) at the John A. Volpe National Transportation

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Systems Center and other technical references consistent with CalEEMod outputs (equipment utilization). The DOT FHWA methodology uses actual noise measurement data collected during the Boston "Big Dig" project (1991-2006) as reference levels for a wide variety of construction equipment in common use, such as on the proposed Project. This noise analysis did not include field measurements of ambient noise in the vicinity of the Project site.

The FHWA noise model provides relatively conservative predictions because it does not account for site-specific geometry, dimensions of nearby structures, and local environmental conditions that can affect sound transmission, reflection, and attenuation. As a result, actual measured sound levels at receptors may vary somewhat from predictions, typically lower. Additionally, the impacts of noise upon receptors (persons) are subjective because of differences in individual sensitivities and perceptions.

Noise impacts were evaluated against community noise standards contained in the City of San Jacinto General Plan Noise Element as applicable to the vicinity of the Project site. The noise element plan contains policies to implement and maintain noise levels compatible with different land use types. As according to the Noise section, the project site complies with the policies and are applicable to the safety guidelines of Noise elements section.

During construction activities, the Project would generate noise due to operation of minimal off-road equipment, portable equipment, and vehicles at or near the Project site. No significant increase in traffic is expected due to this relatively small project. No strong sources of vibrations are planned to be used during construction activities.

Since the Project is near an urban street, the incremental effect of Project operation (possible slightly increased traffic) would not be quantifiable against existing traffic noise (background) in the Project vicinity (i.e., less than significant impact). Also, since no public or private use airport is closer than 2 miles from the Project site, an evaluation of aircraft noise upon persons residing or working in the Project area is not required.

Environmental Setting:

Noise Descriptors

Noise is typically described as any dissonant, unwanted, or objectionable sound. Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Because the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity, the A-weighted decibel scale (dBA). Table 4-10 lists common sources of sound and their intensities in dBA.

Table 4-10: Typical Sound Level Characteristics

Pressure (N/m^2)	Level (dBA)	Sound Level Characteristic
2000	160	Rocket Launch
600	150	Military Jet Plane Takeoff

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Pressure (N/m^2)	Level (dBA)	Sound Level Characteristic
200	140	Threshold of Pain
60	130	Commercial Jet Plane Takeoff
20	120	Industrial Chipper or Punch Press
6	110	Loud Automobile Horn
2	100	Passing Diesel Truck – Curb Line
0.6	90	Factory – Heavy Manufacturing
0.2	80	Factory – Light Manufacturing
0.06	70	Open Floor Office – Cubicles
0.02	60	Conversational Speech
0.006	50	Private Office – Walled
0.002	40	Residence in Daytime
0.0006	30	Bedroom at Night
0.0002	20	Recording or Broadcasting Studio
0.00006	10	Threshold of Good Hearing – Adult
0.00002	0	Threshold of Excellent Hearing – Child

Sources: Broch 1971, Plog 1988.

Notes:

Reference Level P_O = 0.00002 N/m^2 = 0.0002 µbar

N/m^2 = Newtons per square meter (the Newton is the unit of force derived in the metric system); it is equal to the amount of net force required to accelerate one kilogram of mass at a rate of one meter per second squared (1 kg • 1 m/s^2) in the direction of the applied force.

In most situations, a 3-dBA change in sound pressure is considered a "just detectable" difference. A 5-dBA change (either louder or quieter) is readily noticeable, and a 10-dBA change is a doubling (if louder) or halving (if quieter) of the subjective loudness. Sound from a small, localized source (a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates (drops off) at a rate of 6 dBA for each doubling of the distance.

The duration of noise and the time period at which it occurs are important factors in determining the impact of noise on sensitive receptors. A single number called the equivalent continuous noise level (L_{eq}) may be used to describe sound that is changing in level. It is also used to describe the acoustic range of the noise source being measured, which is accomplished through the maximum L_{eq} (L_{max}) and minimum L_{eq} (L_{min}) indicators.

In determining the daily measure of community noise, it is important to account for the difference in human response to daytime and nighttime noise. Noise is more disturbing at night than during the day, and noise indices have been developed to account for the varying duration of noise events over time, as well as community response to them. The Community Noise Equivalent Level (CNEL) adds a 5-dB penalty to the "nighttime" hourly noise levels (HNLs) (i.e., 7:00 p.m. to 10:00 p.m.) and the Day-Night Average Level (L_{dn}) adds a 10-dB penalty to the evening HNLs (Caltrans 2020, FTA 2006).

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Vibration Descriptors

Vibration is a unique form of noise because its energy is carried through structures and the earth, whereas noise is carried through the air. Thus, vibration is generally felt rather than heard. Typically, ground-borne vibration generated by construction activities attenuates rapidly as distance from the source of the vibration increases. Actual human and structural response to different vibration levels is influenced by a combination of factors, including soil type, distance between the source and receptor, duration, and the number of perceived events.

While not a direct health hazard, the energy transmitted through the ground as vibration may result in structural damage, which may be costly to repair and dangerous in the event of structural failure. To assess the potential for structural damage associated with vibration, the vibratory ground motion in the vicinity of the affected structure is measured in terms of point peak velocity/peak particle velocity (PPV) in the vertical and horizontal directions (vector sum). A freight train passing at 100 feet may cause PPVs of 0.1 inch per second, while a strong earthquake may produce PPVs in the range of 10 inches per second. Minor cosmetic damage to buildings may begin in the range of 0.5 inch per second (Caltrans 2020, FTA 2006).

Regulatory Setting:

California

The State of California does not promulgate statewide standards for environmental noise but requires each city and county to include a noise element in its general plan [California Government Code Section 65302(f)]. In addition, Title 4 of the CCR has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. In general, the guidelines require that community noise standards:

- Protect residents from the harmful and annoying effects of exposure to excessive noise;
- Prevent incompatible land uses from encroaching upon existing or programmed land uses likely to create significant noise impacts; and
- Encourage the application of state-of-the-art land use planning methodologies in the area of managing and minimizing potential noise conflicts.

Construction vibration is regulated at the State level in accordance with standards established by the *Transportation and Construction-Induced Vibration Guidance Manual* issued by Caltrans in 2004. Continuous sources include the use of vibratory compaction equipment and other construction equipment that creates vibration other than in single events. Transient sources create a single isolated vibration event, such as blasting. Thresholds for continuous sources are 0.5 and 0.1 inch per second PPV for structural damage and annoyance, respectively. Thresholds for transient sources are 1.0 and 0.9 PPV for structural damage and annoyance, respectively (Caltrans 2020).

City of San Jacinto General Plan – Noise Element

For this Project, the Noise Element of the City of San Jacinto General Plan contains the applicable evaluation criteria. The Construction Standards section of the noise element

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contains the applicable standards for this Project. The proposed Project can be characterized as a new residential development on a vacant plot of land. Most noise would occur during the grading, site preparation, and building construction when heavy equipment would be operating.

During each of the five construction phases, a different mix of equipment would be operating and cumulative noise levels would vary based on the amount of equipment in operation and the location of each activity at the Project site. In general, use of off-road and portable equipment would generate noise due to engine mechanicals, engine exhaust, driveline mechanicals, shaft-driven devices and accessories, hydraulics operation, ground friction and displacement, and gravity drops (dumping, unloading).

Since no intense percussive actions (e.g., hard rock-breaking, large pile-driving) are planned to occur during the site work, no strong ground-borne vibrations are expected to be generated that could affect nearby structures or be noticeable to their occupants.

The Project is expected to require up to approximately 44 months of planned work activities (i.e., from mobilization to substantial completion) comprising five construction phases:

1. Site Preparation;
2. Grading;
3. Building construction;
4. Paving; and
5. Architectural coating.

The nearest receptors are located an average distance of about 100 meters (330 feet) from the central construction zone from which equipment noise would typically emanate. All proposed construction activities for the Project will take place in daylight during regular business hours. Construction is not expected to occur between the hours of 6:00 p.m. and 7:00 a.m. for the duration of the Project. Deviations from this operating schedule would not affect the noise analysis because noise does not persist or accumulate in the environment.

Results of Construction Screening Noise Analysis:

Types of equipment (FHWA 2006) to be used during the Project and noise-emitting characteristics (i.e., usage factors, reference dBA, and percussive source) are shown in Table 4-11 consistent with CalEEMod outputs.

Table 4-11: FHWA Noise Reference Levels and Usage Factors

CalEEMod Construction Detail			FHWA Equipment Type	Ref.	Usage Factor	Ref. Level	Percussive Source
Phase Name	Equipment Description	Qty.			%	dBA	Yes/No
	Rubber Tired Dozers	3	Tractor (rubber tire)	1	40%	84	No

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CalEEMod Construction Detail			FHWA Equipment Type	Ref.	Usage Factor	Ref. Level	Percussive Source
Phase Name	Equipment Description	Qty.			%	dBA	Yes/No
Site Preparation (1)	Tractors/Loaders/Backhoes	4	Backhoe (with loader)	1	40%	80	No
Grading (2)	Excavators	2	Excavator (hydraulic)	1	40%	85	No
	Graders	1	Grader	1	40%	85	No
	Rubber Tired Dozers	1	Tractor (rubber tire)	1	40%	84	No
	Scrapers	2	Scraper	1	40%	85	No
	Tractors/Loaders/Backhoes	2	Backhoe (with loader)	1	40%	80	No
Building Construction (3)	Cranes	1	Crane	1	16%	85	No
	Forklifts	3	Forklift	1	40%	80	No
	Generator Sets	1	Generator (<25 KVA quiet design)	1	50%	70	No
	Tractors/Loaders/Backhoes	3	Backhoe (with loader)	1	40%	80	No
	Welders	1	Welding Machine (arc welding)	1	50%	70	No
Paving (4)	Pavers	2	Paver (asphalt)	1	50%	85	No
	Paving Equipment	2	Pavement Scarifier	1	20%	85	No
	Rollers	2	Roller	1	20%	85	No
Architectural Coating (5)	Air Compressors	1	Compressor (air)	1	40%	80	No

Source: CalEEMod version 2020.4.0, FHWA 2006.

The City of San Jacinto General Plan Noise Element (City 2006) contains noise standards for residential living spaces. For residential living spaces, an indoor CNEL limit (threshold) of 45 dB[A] is considered acceptable. Table 4-12 shows a comparison of FHWA screening-level estimated daytime interior noise impacts for peak construction activities at nearby receptors with respect to the threshold. If the threshold is not exceeded, then a project should be considered acceptable, i.e., Less Than Significant.

Table 4-12: Estimated Peak Activity Daytime Noise Impacts – Residential Receptors

Construction Phases	Normal Acceptance Criteria (Residential Interior)		
	Modeled Noise Level (L_{eq}dBA)[a]	Significance Threshold (CNEL dBA)[b]	Exceeds Threshold? (Yes/No)
Background	40.2	45	No

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Construction Phases	Normal Acceptance Criteria (Residential Interior)		
	Modeled Noise Level (L_{eq}dBA)[a]	Significance Threshold (CNEL dBA)[b]	Exceeds Threshold? (Yes/No)
Site Preparation	43.4	45	No
Grading	44.9	45	No
Building Construction	42.6	45	No
Paving	43.9	45	No
Architectural Coating	40.6	45	No
Long-Term Impact	40.2	45	No

Sources: CalEEMod version 2020.4.0, FHWA 2006, Broch 1971, Plog 1988, City 2006.

Notes:

[a] Includes existing street traffic and ambient noise sources (cumulative impacts)

[b] Refer to applicable City or County General Plan Noise Element and Municipal Code Noise Ordinance for thresholds

Operational Noise:

Upon completion of construction and occupancy of the proposed Project, on-site operational noise would be generated mainly by residential-grade HVAC equipment installed on the new buildings. However, the overall noise levels generated by the new HVAC equipment are not expected to be substantially greater than those generated by older HVAC equipment installed on existing buildings near the Project site. As such, the new HVAC equipment associated with the proposed Project would not represent a substantially new type or source of noise in the general vicinity.

The proposed residential Project would not be a source of industrial noise. No adverse impacts are expected from, and no special noise mitigation measures would be required for, the operation of the proposed Project. Therefore, the operational noise impacts of the proposed Project would be less than significant.

Interior areas of the completed Project would not be adversely impacted by ambient (outdoor) urban noise because the Project would be constructed to meet applicable California Code of Regulations (CCR) Title 24 Parts 6 and 11 building energy efficiency standards (CEC 2019). Thermal insulation, e.g., fiberglass batting in exterior walls and double-pane windows, also attenuates sound transmission and thus would provide an acceptable interior noise environment, which is particularly important for sensitive land uses. Specifically, the proposed Project would be designed and constructed to maintain interior noise levels at or below a CNEL of 45 dBA in any normally occupied space of the Project with no other sources of interior noise operating, such as HVAC, appliances, power tools, or office equipment. As such, interior noise impacts of the proposed Project would be less than significant.

Environmental Determination:

a) Generation of substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies?

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Impact: Less Than Significant Impact

As shown in the above analysis, temporary construction noise would be limited to daylight hours and would permanently cease upon completion of construction. Aggregated average construction noise is not expected to exceed 45 dBA at nearby residential receptors (interiors), which is below the unacceptable range. Operational noise sources for residential buildings, such as new residential-grade HVAC equipment, are of quiet design per commercial standards. Neither construction nor operation of the proposed Project would result in increasing ambient noise levels in excess of applicable standards. Thus, impacts on temporary and permanent ambient noise levels in the vicinity of the proposed Project would be less than significant.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Impact: Less Than Significant Impact

The proposed single-family home foundations will be standard concrete slab design on a flat site. Only shallow excavation, trenching, and grading will be required for the foundations and utilities. Construction plans do not include intense percussive actions (e.g., hard rock-breaking, large pile-driving). Therefore, no strong ground-borne vibrations are expected to be generated that could affect nearby structures or be noticeable to their occupants. The proposed Project would have a less than significant impact with regards to ground-borne vibration and noise levels.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport would the project expose people residing or working in the project area to excessive noise level?

Impact: No Impact

There is no public or private use airport within 2 miles of the Project site; therefore, no impacts would be expected.

Mitigation Measures:

None required.

4.3.14 Population and Housing

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. Population and Housing. Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☑	☐

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Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑

Environmental Determination:

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

Impact: Less than Significant Impact

As per the updated policy the housing elements shall consist of analysis of housing need based on programs for preservation, improvement and developing of housing. An analysis of population and employment trends and an inventory of land feasibility and availability for residential development. The proposed project site reflects the updated section of 65583 of the General Plan Use elements. The project has been Planned on feasible and safe site with an analysis of special housing needs that includes energy efficient improvements. The housing project fair housing society regardless of race, religious, sex and marital status as per the General Plan.

The proposed Project would construct 206 single-family residences on 37.87 acres, resulting in 5.43 units per acre. The Project site was planned for residential development by the City, and as such, any population growth as a result of the proposed Project has been planned. The entire Project site consists of land zoned for both Medium Density Residential (MDR) and Low Density Residential (LDR). The City's General Plan LU-30 cites a maximum residential density for LDR zoned areas of 5 units per acre, with an average of 4 units per acre. The maximum residential density for MDR zoned areas is 10 units per acre, with an average of 6 units per acre. The property has been divided into two zoning based on unit calculation as per the 37.87 acres project site. Based on the area two zones have been allocated to design and execute the project Plan. Therefore, the number of residences that would be developed within the Project site is consistent with planned growth in the General Plan Land Use Element, and unplanned growth would not occur.

The General Plan Land Use Element Table LU-3 identifies the development capacity of the General Plan land uses and provides an estimated persons per household of 2.87. Based on the General Plan assumption, the 206 proposed single-family residences could result in an increased population of approximately 530 residents. The California Department of Finance estimates that in January 2021, the City of San Jacinto had a population of approximately 51,270 and 16,290 housing units (Estimates | Department of Finance (ca.gov))The proposed Project would result in a 1.0% increase in residents and a 1.1% increase in housing units in the City, which is not substantial growth.

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In addition, the proposed Project would be served by the existing public roadways, namely North Ramona Boulevard. The Project site is located less than one (1) mile from the intersection with California State Route 79 (Ramona Expressway), a major throughway within the City. The proposed Project would connect into the existing utility and infrastructure system. The proposed Project does not include, and would not result in, an extension of roads or other infrastructure outside of the Project area that could induce substantial population growth in the area. Therefore, the proposed Project would have less than significant direct and indirect impacts on unplanned population growth.

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

Impact: No Impact

Presently, the Project site is undeveloped and was historically used for agricultural uses without any housing or residential elements. Therefore, development of the proposed Project would have no impact on displacing any existing people or housing.

Mitigation Measures:

None required.

4.3.15 Public Services

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. Public Services. Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:	☐	☑	☐	☐
Fire protection?				
Police protection?				
Schools?				
Parks?				
Other public facilities?				

Environmental Determination:

a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant

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environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:

Fire Protection? ***Parks?***

Police Protection? ***Other Public Facilities?***

Schools?

Impact: Less Than Significant with Mitigation Incorporated

Fire Protection

Fire protection services within the City of San Jacinto are served by River Side Country Fire Department (RCFD). The Fire Department has two (2) fire stations in the City:

- Station 78 is located 1.7 miles south of the Project site at 12450 West Cottonwood Avenue; and
- Station 25 is located 2.8 miles southeast of the Project site at 132 South San Jacinto Avenue.

The Project involves the construction of 206 single-family residences, 5290 new residents and total 57,779 according to world population review data. which may increase the number of emergency calls and demand for RCFD and emergency services. To maintain the level of fire protection and emergency services, the RCFD may require additional fire personnel and equipment. A detail analysis of the past incidents and respond from RCFD and its location availability to the project site at current does not recommend a new nearby location to the project sit. As existing RCFD location is feasible to respond if required. However, it is not anticipated that there would be a need to build a new or expand an existing fire station to serve the proposed Project and maintain acceptable service ratios, response times, or other performance objectives for fire protection. By analyzing data from previous years and continuously monitoring current data regarding response times, types of incidents, and call frequencies, RCFD can shift resources to meet local demands for fire protection and emergency services. The proposed Project would create neither capacity nor service level problems, nor would it result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection. The service coverage area of RCFD is also included in San Jacinto providing Disaster preparation and safety including early warning notifications. RCFD has different departments to cope with emergencies with fast service 24 hours.

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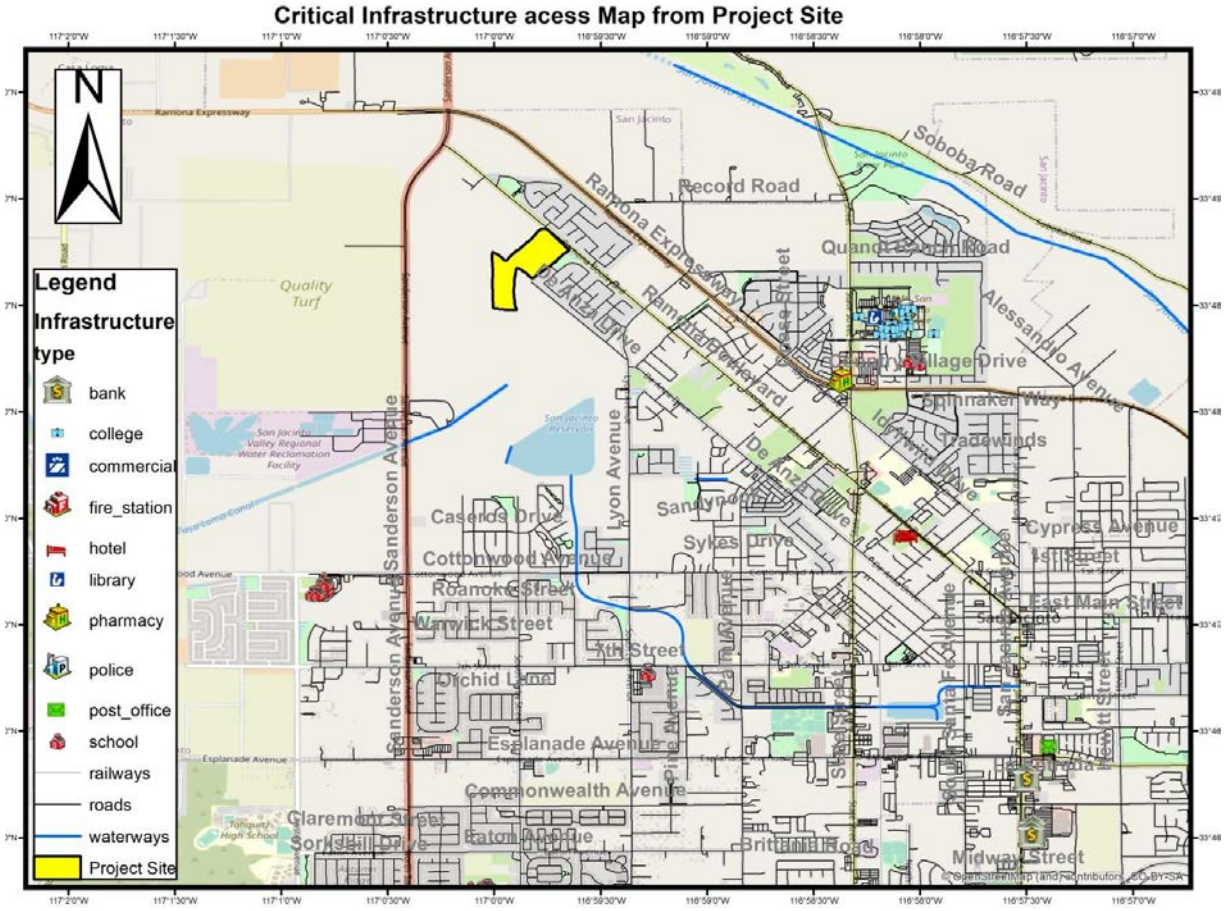

Police Protection

Police protection services within the City of San Jacinto are served by the Riverside County Sheriff's Department. The police station is located at 160 West 6th Street, approximately 3 miles southeast of the Project site. The City's General Plan EIR states that the City was staffed at a ratio of 1.08 officers per 1,000 residents. Assuming a net increase of 528 residents resulting from the development of 206 single-family residences, there would be an incremental increase in demand constituting the work of half a full-time officer, which is less than significant. There would be no need for new or physically altered police facilities as a result of this proposed Project.

Schools

The development of 206 single-family residences and 528 new residents will be added to the city, which may lead to an increase in the number of children served by San Jacinto Unified School District (SJUSD). SJUSD consists of seven elementary schools, three middle schools, and two high schools. Table 3 in the School Fee Justification Study demonstrates the student generation rate for single-family detached (SFD) residences by school level as shown in Table 4-13.

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Table 4-13: Students Generated by Proposed Project (San Jacinto Adopted GPU.pdf (civiclive.com))

School Level	Student Generation Rate for SFD Residences	Students Generated by Project (206 SFD Residences)
Elementary	0.3219	67
Middle	0.1620	34
High	0.2073	43
Total	**0.6912**	**143**

The proposed project will accommodate new students in existing schools as the availability of schools within the vicinity and surrounds are sufficient to avail the new students. Education Code Section 17620 authorizes the governing board of a school district to levy school fees to offset the impacts to school facilities from new residential and commercial/industrial construction and reconstruction. To levy Level I fees (statutory fees), a school district must prepare and adopt a school fee justification study pursuant to the provisions of Education Code Section 17620 and Sections 65995 and 66001 of the Government Code. SJUSD developed the School Fee Justification Study to demonstrate the relationship between new residential and commercial/industrial development and SJUSD's need for construction of school facilities, including the cost of school facilities, modernization of existing school facilities, and the amount per square foot of Level I fees that may be levied on residential and commercial/industrial development in accordance with Education Code Section 17620 (SJUSD 2022). As such, the proposed Project would remit residential fee offsets to SJUSD according to the School Fee Justification Study. Impacts on school facilities would be less than significant after the required Residential Fee Offsets payment (MM-PS-1).

Parks

Municipal Code Section 16.40.030 states the general standard requirement that 5 acres be dedicated to local park and recreational purposes for every 1,000 residents or payment of an in-lieu fee. 528 residents are anticipated to reside within the proposed Project development, therefore requiring 2.64 acres of parkland dedication within the proposed subdivision.

The proposed Project does not incorporate parkland dedication, and therefore would be required to pay an in-lieu (offsite mitigation) fee to the City (MM-PS-2). With the payment of in-lieu fees, impacts related to the need to provide new or altered park and recreation facilities in order to maintain acceptable service ratios would be less than significant.

Other Public Facilities

The proposed Project is consistent with all applicable zoning and land use designations; therefore, impacts related to the increase in demand of public services as a result of the proposed development were planned. The Project vicinity is zoned for residential land uses; therefore, the Project site is adjacent to existing single-family residential developments. These existing developments utilize public facilities such as libraries and post offices. The increase in demand for other public facilities is incremental relative to the existing demand.

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As a result, the proposed Project would have a less than significant impacts on other public facilities.

Mitigation Measures:

(MM) Mitigation measure refers to the plan set for school staff and class room space management to accommodate additional enrollments.

MM-PS-1: Residential Fee Offsets. The school district's proposed Level I fee of $4.79 per weighted average square foot of a residential unit in SJUSD shall be paid to the City. These fees shall be used to mitigate the effects of additional enrollment at K-12 public schools resulting from the proposed Project, e.g., additional classroom space and hiring teachers.

MM-PS-2: Parkland In-Lieu Fees. Pursuant to Municipal Code 16.40.080, fees shall be paid to the City in lieu of park land dedication. These fees shall be used to mitigate the effects of additional demand for park facilities resulting from the proposed Project, e.g., facility improvements and/or expansions.

4.3.16 Recreation

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. Recreation.				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☑	☐	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☑

Environmental Determination:

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Impact: Less than Significant with Mitigation Incorporated

According to the City's website, there are currently over 170 acres of public parks and grassy common areas open to the general public within City limits. The Municipal Code Section 16.40.040 states that the parkland dedication requirement for single-family residences is 0.015 acres per unit or payment of an in-lieu fee. The proposed Project would

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develop 206 single-family residences and would therefore require a parkland dedication of 2.64 acres. The proposed Project does not include parkland dedication, and therefore would be required to pay an in-lieu fee to the City as described in the City's Municipal Code Section 16.40. With the payment of in-lieu fees (MM-PS-2), impacts related to the need to provide new or altered park and recreation facilities in order to maintain acceptable service ratios would be less than significant with mitigation incorporated.

Residents of the proposed development would also utilize existing and future City parks and recreation facilities. The incremental increase in demand and utilization may affect the rate of physical deterioration of existing park and recreational facilities. However, there are numerous parks and other recreational facilities available that are designed for utilization. For example, Potaton ranch park is located within 100 meters, Rancho Las Palmas Perris Park is Located within 5 km and Col Lewis Millte Park is located at 0.70 km from the proposed project site. As a result, park's deterioration because of the increase of utilization would not increase beyond what is reasonably expected. Secondly, following the environmental codes and regulations while visiting the parks is essential and mandatory for the public to maintain the resources. Therefore, impacts would be less than significant with mitigation incorporated.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Impact: No impact

As mentioned in above section with a resource map and different locations of recreational facilities to the proposed site, there is no need to construct new recreational facilities. Though if in future it is needed there will be less than significant impact but currently there is no impact.

Mitigation Measures:

None required.

4.3.17 Transportation

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. Transportation. Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☑	☐
b) Conflict or be inconsistent with CEQA Guidelines §15064.3, subdivision (b)?	☐	☐	☑	☐

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Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☑	☐
d) Result in inadequate emergency access?	☐	☐	☑	☐

Summary:

A Local Traffic Assessment (Traffic Study) was prepared for the proposed Project by K2 Traffic Engineering on September 29, 2021 (Appendix E). The Project is expected to have a trip generation of 136 trips in the AM peak hour, including 34 inbound and 102 outbound trips; 182 trips in the PM peak hour, including 115 inbound and 67 outbound trips; and 1,737 daily trips. The Project would not result in any operational deficiencies at study intersections. Therefore, local improvements would not be required.

As we talk about VMT (Vehicle Miles Traveled) the project has adopted VOL policies that set standards for which San Jacinto road infrastructure will strive to maintain. Further projects that are local serving would decrease the number of trips based on available facilities like, parks, schools, banks and other infrastructure.

The project based on family units and road infrastructure is in a low VMT or VMT reducing project.

The study found that the intersection of Ramona Expressway and Sanderson Avenue has been operating at LOS F in the AM peak hour for existing conditions as well as the Project opening year. However, the Project's contribution to the pre-existing operational deficiency would be negligible and local improvements would not be required according to City's local traffic assessment guidelines.

Site access is provided on Ramona Boulevard by the proposed residential street temporarily named "A Street," which will be the main entrance to the Project site. An exclusive eastbound right-turn pocket and an exclusive westbound left-turn pocket will be provided on Ramona Boulevard. This access will be controlled by a Stop sign posted on "A Street" along with corresponding pavement markings.

A secondary access point for the development will be provided on Sanderson Avenue at the proposed De Anza Drive, which provides one lane in each direction with a pavement width of 26 feet. The intersection of De Anza Drive and Sanderson Avenue will be controlled by traffic signals. Upon Project completion, De Anza Drive will serve as a collector for the subject community solely until future developments progress in the surrounding area.

The following intersections were studied for level of service (LOS) analysis to evaluate the potential traffic impacts:

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1. Sanderson Avenue at Ramona Expressway;
2. Sanderson Avenue at Ramona Boulevard;
3. Lyon Avenue/Potter Road at Ramona Expressway;
4. Lyon Avenue at Ramona Boulevard;
5. Ramona Boulevard at A Street; and
6. Sanderson Avenue at J Street/De Anza Drive.

The LOS analysis is performed using SYNCHRO software based on the methodologies prescribed in the Highway Capacity Manual (HCM). For signalized intersections, the average control delay per vehicle is estimated for each lane group and aggregated for each approach and for the intersection as a whole. For unsignalized intersections, LOS is related to the control delay for each stop-controlled movement. Table 4-14 provides the relationship between control delay per vehicle and LOS for both signalized and unsignalized intersections.

Table 4-14: LOS Definitions

LOS	Signalized Average Control Delay (sec/veh)	Unsignalized Average Control Delay (sec/veh)	General Description
A	0-10	0-10	Free Flow
B	>10-20	>10-15	Stable Flow (slight delays)
C	>20-35	>15-25	Stable Flow (acceptable delays)
D	>35-55	>25-35	Approaching Unstable Flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55-80	>35-50	Unstable Flow (intolerable delay)
F	>80	>50	Forced Flow (congested and queues fail to clear)

Existing Conditions

The Project site is located on the southwest side of Ramona Boulevard between Shimmering Way and Ranch View Lane in the City of San Jacinto. The site is currently vacant and unimproved.

Ramona Boulevard is classified as a Secondary Roadway in the General Plan's roadway system map. It generally runs east westerly with one lane in each direction divided by a stripped median. The posted speed limit is 45 miles per hour (mph) in the Project vicinity.

Sanderson Avenue is a north-southerly Urban Arterial in the General Plan's roadway system map that currently provides two lanes in each direction divided by a two-way left-turn lane south of Ramona Boulevard. The posted speed limit is 55 mph in the Project vicinity.

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Ramona Expressway is a Limited Access Conventional Highway in the Project vicinity and currently provides three lanes in each direction divided by a raised median and left-turn lanes at major intersections. The posted speed limit is 65 mph in the Project vicinity.

Lyon Avenue is a north-southerly Major Roadway in the General Plan's roadway system map that currently provides one lane in each direction. The posted speed limit is 45 mph the Project vicinity. The intersection of Lyon Avenue and Ramona Boulevard is controlled by stop signs for all approaches. The intersection of Lyon Avenue and Ramona Expressway is controlled by traffic signals.

De Anza Drive is a Collector in General Plan's roadway system map that begins at Lyon Avenue and extends south to Main Street. It currently provides one lane in each direction and has a posted speed limit of 40 mph.

Turning movement counts in the AM and PM peak hours were collected on Thursday, July 29, 2021. LOS and overall delay for existing conditions are shown in Table 4-15. For existing conditions, all study intersections currently operate at LOS D or better during the AM and PM peak hours, except for the following location:

- Sanderson Avenue at Ramona Expressway (#1): LOS F in the AM peak Hour.

Table 4-15: Existing Conditions– Levels of Service and Approach Delays

Intersection	Control Type	AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
1. Sanderson Ave at Ramona Expy	TS	F	92.3	D	47.8
2. Sanderson Ave at Ramona Blvd	TS	B	10.7	B	15.7
3. Lyon Ave/Potter Rd at Ramona Expy	TS	C	24.7	C	25.8
4. Lyon Ave at Ramona Blvd	AWSC	A	9.5	B	11.2

Note: TS = Traffic Signal; AWSC = All-way-stop control; TWSC = Two-way-stop control; Delay in seconds.

Trip Generation

Trip generation represents the amount of traffic attracted and produced by the Project development. Based upon the recommendations of "Trip Generation, 10th Edition," published by the Institute of Transportation Engineers (ITE), applicable trip generation rates are shown in Table 4-16.

Table 4-16: Trip Generation Rate

Land Use	Unit	Daily	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
Single-Family Detached Housing (210)	Dwelling Unit	9.44	0.74	25%	75%	0.99	63%	37%

The calculated Project trip generation is summarized in Table 4-17. The Project is expected to have a trip generation of 136 trips in the AM peak hour, including 34 inbound and 102 outbound trips; 182 trips in the PM peak hour, including 115 inbound and 67 outbound trips; and 1,737 daily trips.

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Table 4-17: Project Trip Generation

Land Use	Unit	Quantity	AM Peak Hour			PM Peak Hour			Daily
			Total	In	Out	Total	In	Out	
Single-Family Detached Housing (210)	Dwelling Unit	206	136	34	102	182	115	67	1,737

Existing Conditions Plus Project

LOS and approach delays at the study intersections for the existing conditions plus Project scenario are shown in Table 4-18. All intersections will operate at acceptable LOS D or better for the AM and PM peak hours except for the following intersection:

- Sanderson Avenue at Ramona Expressway (#1): LOS F in the AM Peak Hour.

Table 4-18: Existing Conditions Plus Project – Levels of Service and Approach Delays

Intersection	Control Type	AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
1. Sanderson Ave at Ramona Expy	TS	F	92.5	D	49.0
2. Sanderson Ave at Ramona Blvd	TS	B	12.3	B	18.1
3. Lyon Ave/Potter Rd at Ramona Expy	TS	C	24.7	C	26.2
4. Lyon Ave at Ramona Blvd	AWSC	A	9.9	B	12.0
5. Ramona Blvd at "A St"	TWSC	A	9.6	B	11.9
6. Sanderson Ave at De Anza Dr	TS	A	5.4	A	5.5

Note: TS = Traffic Signal; AWSC = All-way-stop control; TWSC = Two-way-stop control; Delay in seconds.

Opening Year Plus Project

The LOS and approach delays for the study intersections under opening year plus Project conditions are shown in Table 4-19. All study intersections remain operating at acceptable LOS D or better except for the following intersection:

- Sanderson Avenue at Ramona Expressway (#1): LOS F in the AM peak hour and LOS E in the PM peak hour.

Table 4-19: Opening Year Plus Project

Intersection	Control Type	AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
1. Sanderson Ave at Ramona Expy	TS	F	97.4	D	55.9
2. Sanderson Ave at Ramona Blvd	TS	B	12.9	B	19.4
3. Lyon Ave at Ramona Expy	TS	C	25.8	C	28.1
4. Lyon Ave at Ramona Blvd	AWSC	A	10.0	B	12.3
5. Ramona Blvd at "A St"	TWSC	A	9.6	B	12.1
6. Sanderson Ave at De Anza Dr	TS	A	5.4	A	5.8

Note: TS = Traffic Signal; AWSC = All-way-stop control; TWSC = Two-way-stop control; Delay in seconds.

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Regulatory Setting:

General Plan Requirement

According to the City of San Jacinto "Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment" and consistent with the acceptable in the City's General Plan, the City considers the following criteria in signalized intersection operating requirements:

- Any signalized study intersection operating at an acceptable LOS D or better without Project traffic in which the addition of Project traffic causes the intersection to degrade to a LOS E or LOS F shall identify improvements to improve operations to LOS D or better; and
- Any signalized intersection that is operating at LOS E or F without Project traffic where the Project increases delay by 5.0 or more seconds shall identify improvements to offset the increase in delay.

The City considers the following unsignalized intersection criteria when identifying operational deficiencies:

- An operational improvement would be required if either section a) or both sections b) and c) occur:
    a) The addition of Project-related traffic causes the intersection to degrade from an acceptable LOS D or better to LOS E or F; OR
    b) The Project adds 5.0 seconds or more of delay to an intersection that is already projected to operate without Project traffic at a LOS E or F; AND
    c) The intersection meets the peak hour traffic signal warrant after the addition of Project traffic.

If the conditions above are satisfied, improvements should be identified that achieve the following:

- LOS D or better for case a) or to pre-project LOS and delay for case b).

Environmental Determination:

a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Impact: Less Than Significant Impact

Based on existing conditions, Project traffic does not cause any operational deficiency at study intersections, as shown in Table 4-20. The General Plan Designated Road will further uplift the smooth circulation and will not cause any operational deficiency.

Therefore, local improvements are not required.

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Table 4-20: Operational Deficiency Analysis – Existing Conditions

Intersection	Control Type	Without Project		With Project			Delay Increase	Operational Deficiency
		LOS	Delay	LOS	Delay	Target LOS		
AM Peak Hour								
1. Sanderson Ave at Ramona Expy	TS	F	92.3	F	92.5	–	0.2 (<5, OK)	No
2. Sanderson Ave at Ramona Blvd	TS	B	10.7	B	12.3	D (OK)	–	No
3. Lyon Ave/Potter Rd at Ramona Expy	TS	C	24.7	C	24.7	D (OK)	–	No
4. Lyon Ave at Ramona Blvd	AWSC	A	9.5	A	9.9	D (OK)	–	No
5. Ramona Blvd at "A St"	TWSC	–	–	A	9.6	D (OK)	–	No
6. Sanderson Ave at De Anza Dr	TS	–	–	A	5.5	D (OK)	–	No
PM Peak Hour								
1. Sanderson Ave at Ramona Expy	TS	D	47.8	D	49.0	D (OK)	–	No
2. Sanderson Ave at Ramona Blvd	TS	B	15.7	B	18.1	D (OK)	–	No
3. Lyon Ave at Ramona Expy	TS	C	25.8	C	26.2	D (OK)	–	No
4. Lyon Ave at Ramona Blvd	AWSC	B	11.2	B	12.0	D (OK)	–	No
5. Ramona Blvd at "A St"	TWSC	–	–	B	11.9	D (OK)	–	No
6. Sanderson Ave at De Anza Dr	TS	–	–	A	5.5	D (OK)	–	No

Note: TS = Traffic Signal; AWSC = All-way-stop control; TWSC = Two-way-stop control; Delay in seconds.

At the Project opening year, Project traffic does not cause any operational deficiency at study intersections, as shown in Table 4-21. Therefore, local improvements are not required.

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Table 4-21: Operational Deficiency Analysis – Opening Year

Intersection	Control Type	Without Project		With Project			Delay Increase	Operational Deficiency
		LOS	Delay	LOS	Delay	Target LOS		
AM Peak Hour								
1. Sanderson Ave at Ramona Expy	TS	F	97.0	F	97.4	–	0.5 (<5, OK)	No
2. Sanderson Ave at Ramona Blvd	TS	B	11.0	B	12.9	D (OK)	–	No
3. Lyon Ave/Potter Rd at Ramona Expy	TS	C	25.8	C	25.8	D (OK)	–	No
4. Lyon Ave at Ramona Blvd	AWSC	A	9.7	A	10.0	D (OK)	–	No
5. Ramona Blvd at "A St"	TWSC	–	–	A	9.6	D (OK)	–	No
6. Sanderson Ave at De Anza Dr	TS	–	–	A	5.4	D (OK)	–	No
PM Peak Hour								
1. Sanderson Ave at Ramona Expy	TS	D	54.4	D	55.9	–	1.5 (<5, OK)	No
2. Sanderson Ave at Ramona Blvd	TS	B	16.8	B	19.4	D (OK)	–	No
3. Lyon Ave at Ramona Expy	TS	C	27.6	C	28.1	D (OK)	–	No
4. Lyon Ave at Ramona Blvd	AWSC	B	11.5	B	12.3	D (OK)	–	No
5. Ramona Blvd at "A St"	TWSC	–	–	B	11.5	D (OK)	–	No
6. Sanderson Ave at De Anza Dr	TS	–	–	A	5.8	D (OK)	–	No

Note: TS = Traffic Signal; AWSC = All-way-stop control; TWSC = Two-way-stop control; Delay in seconds.

The study found that the intersection of Ramona Expressway and Sanderson Avenue has been operating at LOS F in the AM peak hour for existing conditions as well as the Project opening year. However, the Project's contribution to the pre-existing operational deficiency is negligible and local improvements are not required, according to City's local traffic assessment guidelines.

The commuter rail serving parts of Riverside County has not yet expanded into San Jacinto. Public bus service is provided by the Riverside Transit Agency. Three bus routes currently

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operate in the City of San Jacinto. Route 31 provides access along State Street and to the north and south ends of the City. Route 32 serves Mount San Jacinto Community College. Route 42 provides service from the eastern portion of the City to shopping areas in the south. These existing bus routes provide limited access to the employment centers, shopping, and recreational areas within the City. The proposed Project will have no impact on the existing bus routes.

The nearest bikeway to the Project site is the Class I Bikeway along Ramona Expressway. The proposed Project may result in an incremental increase on traffic along Ramona Expressway. However, cumulative impacts on bicycle facilities would be less than significant.

The proposed Project would have an overall less than significant impact on any conflicts with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. No mitigation is required.

b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?

Impact: Less Than Significant Impact

CEQA Guidelines Section 15064.3 – Determining the Significance of Transportation Impacts states that vehicle miles traveled (VMT) is the most appropriate measure of transportation impacts and provides lead agencies with the discretion to choose the most appropriate methodology and thresholds for evaluating VMT. The City of San Jacinto Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment provides the following VMT screening criteria from the Western Riverside Council of Governments (WRCOG) to assess the potential for VMT impacts (City of Riverside 2020):

1. Transit Priority Area (TPA) Screening: Projects which are located within a TPA are presumed to have a less than significant impact on VMT.
2. Low VMT Area Screening: This screening threshold applies to residential or office projects that are located within a low VMT-generating area, which are identified by WRCOG as traffic analysis zones (TAZ) where total daily VMT per service population performs at or below the jurisdictional average of total VMT per service population under base year (2012) conditions. Projects which are located within a low VMT-generating area are presumed to have a less than significant impact on VMT.
3. Project Type Screening: Local serving projects listed in the Transportation Impact Assessment (TIA) Guidelines and projects that generate fewer than 110 net new daily vehicle trips (or 11 single-family residences) are presumed to have a less than significant impact on VMT.

The Traffic Study prepared for the proposed Project used the VMT screening tool, Riverside County Traffic Analysis Model (RIVTAM). The screening tool identified that the jurisdictional average 2012 daily home-based work VMT per worker was 7.59. The Project TAZ 2012 daily home-based work VMT per worker was 4.43. Therefore, the proposed Project was screened from the VMT assessment due to low VMT generating TAZ

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based on Home-Based Work VMT. The proposed Project is consistent with CEQA Guidelines Section 15064.3, subdivision (b).

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Impact: Less than Significant Impact

The proposed Project will not include any incompatible land uses such as farm equipment. Furthermore, the proposed Project does not have any geometric design features that may pose as a hazard. The proposed Project will add a residential street temporarily named "A Street," and an accompanying exclusive eastbound right-turn pocket and an exclusive westbound left-turn pocket will be provided on Ramona Boulevard. This access will be controlled by a stop sign posted on "A Street. "As the design of streets are not geometric that involves sharp turn or hazard prone shapes. Further the street A is also controlled by a stop sign and the design feature does not include any hazard prone designs which may cause harm and such parameters of future impacts have been analyzed before designing the streets. The proposed Project is not anticipated to substantially increase hazards due to a geometric design feature or incompatible uses; therefore, impacts would be less than significant.

d) Result in inadequate emergency access?

Impact: Less than Significant Impact

During Project construction, the site would be required to ensure emergency access in accordance with Section 503 of the California Fire Code (24 CCR Part 9), which would be ensured through the City's permitting process. Implementation of the proposed Project through the City's permitting process would ensure adherence to existing regulations and would reduce potential construction-related emergency access impacts to a less than significant level. The Project site plan was designed in compliance with all applicable City codes and approved by the City. Therefore, cumulative impacts related to emergency access are less than significant.

Mitigation Measures:

None required.

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4.3.18 Tribal Cultural Resources

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. Tribal Cultural Resources.				
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code §21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	☐	☑	☐	☐
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☑	☐	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision © of Public Resources Code §5024.1. In applying the criteria set forth in subdivision © of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☑	☐	☐

Summary:

Refer to Section 4.3.5, Cultural Resources.

Regulatory Setting:

Assembly Bill 52

AB 52 of 2014 amended PRC Section 5097.94 and added PRC Sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3. AB 52 established that tribal cultural resources must be considered under CEQA and also provided for additional Native American consultation requirements for the lead agency. PRC Section 21074 describes a tribal cultural resource as a site, feature, place, cultural landscape, sacred place,

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or object that is considered of cultural value to a California Native American tribe. A tribal cultural resource (TCR) is:

- On the CRHR or a local historical register;
- Eligible for the CRHR or a local historical register; or
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1.

AB 52 formalizes the lead agency tribal consultation process, requiring the lead agency to initiate consultation with California Native American groups that are traditionally and culturally affiliated with the Project area, including tribes that may not be federally recognized. Lead agencies are required to begin consultation prior to the release of a Negative Declaration, Mitigated Negative Declaration (MND), or EIR.

Section 1 (a)(9) of AB 52 establishes that "a substantial adverse change to a tribal cultural resource has a significant effect on the environment." Effects on TCRs should be considered under CEQA. Section 6 of AB 52, which adds Section 21080.3.2 to the PRC, which states that parties may propose mitigation measures "capable of avoiding or substantially lessening potential significant impacts to a tribal cultural resource or alternatives that would avoid significant impacts to a tribal cultural resource." Further, if a California Native American tribe requests consultation regarding project alternatives, mitigation measures, or significant effects on TCRs, the consultation shall include those topics [PRC Section 21080.3.2(a)]. The environmental document and the mitigation monitoring and reporting program (where applicable) shall include any mitigation measures that are adopted [PRC Section 21082.3(a)].

The City received responses from the Rincon Band of Luiseño Indians, Soboba Band of Luiseño Indians. No other responses were received.

Environmental Determination:

a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)

ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

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Impact: Less Than Significant with Mitigation Incorporated (refer to Section 4.3.5 Cultural Resources)

A significant impact would occur if the Project would cause a substantial adverse change in the significance of a TCR, defined in PRC Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place or object with cultural value to a California Native American tribe, i.e., the Soboba Band of Luiseño Indians in the Project area, which is listed or eligible for listing in the CRHR or in a local register of historical resources as defined in PRC Section 5020.1(k). A project-specific Phase I Cultural Resources Assessment (Phase I Assessment) was prepared by Archaeological Associates (2021), included as Appendix C of this ISMND. The Phase I Assessment included results from a partial search, it refers to initial sample study for the case as it included sites within 1-mile radius of the project initially. of all available previously recorded prehistoric and historic archaeological sites situated within a 1-mile radius of the study area. Additionally, the National Register of Historic Places (NRHP), CRHR, California Historical Landmarks (CHL), California Points of Historical Interest (CPHI), and the California Directory of Properties [also known as the Historic Resources Inventory (HRI)] were reviewed for the purpose of identifying any historic properties. Pertinent archaeological reports were also reviewed and all relevant information was incorporated into the study. A current records search at the Eastern Information Center (EIC) housed at the University of California at Riverside was not available due to the ongoing COVID-19 virus crisis. Alternatively, records from previous, nearby assessments as well as those from others were utilized. Thus, some data were lacking.

While there are currently no recorded archaeological sites within the Project area, buried resources could potentially be unearthed during Project activities. Therefore, customary caution and a halt-work condition would be in place for all ground-disturbing activities. In the event that any evidence of cultural resources is discovered, all work within the vicinity of the find would stop until a qualified archaeological consultant can assess the find and make recommendations. Excavation of potential cultural resources would not be attempted by Project personnel.

Approved by Governor Brown on September 25, 2014, AB52 establishes a formal consultation process for California Native American tribes to identify potential significant impacts to TCRs, as defined in PRC Section 21074, as part of CEQA. Effective July 1, 2015, AB 52 applies to projects that file a Notice of Intent of a Negative Declaration, MND, or EIR on or after July 1, 2015. PRC Section 21084.2 now establishes that a project that may cause a substantial adverse change in the significance of a TCR is a project that may have a significant effect on the environment. To help determine whether a project may have such an effect, PRC Section 21080.3.1 requires a lead agency to consult with any California Native American tribe that requests consultation and is traditionally and culturally affiliated with the geographic area of the proposed Project. That consultation must take place prior to the release of a Negative Declaration, MND, or EIR for the Project. As a result of AB 52, the following must take place: 1) prescribed notification and response timelines; 2) consultation on alternatives, resource identification, significance determinations, impact evaluation, and mitigation measures; and 3) documentation of all consultation efforts to support CEQA findings for the administrative record.

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Under AB 52, if a lead agency determines that a project may cause a substantial adverse change to a TCR, the lead agency must consider measures to mitigate that impact. PRC Section 21074 provides a definition of a TCR. In brief, in order to be considered a TCR, a resource must be either: 1) listed, or determined to be eligible for listing, on the national, State, or local register of historic resources, or 2) a resource that the lead agency chooses, in its discretion supported by substantial evidence, to treat as a TCR. In the latter instance, the lead agency must determine that the resource meets the criteria for listing in the CRHR or City Designated Cultural Resource. In applying those criteria, a lead agency shall consider the value of the resource to the tribe.

As specified in AB 52, lead agencies must provide notice to tribes that are traditionally and culturally affiliated with the geographic area of a proposed Project if the tribe has submitted a written request to be notified. The tribe must respond to the lead agency within 30 days of receipt of the notification if it wishes to engage in consultation on the Project, and the lead agency must begin the consultation process within 30 days of receiving the request for consultation. The City will engage with tribes traditionally and culturally affiliated with the geographic area of the Project site as part of AB 52.

Mitigation Measures:

None required with the implementation of MM-CUL 1 though 7.

4.3.19 Utilities and Service Systems

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX. Utilities and Service Systems. Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☑	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☑	☐

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Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Result in a determination by the waste water treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☑	☐
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☑	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☑

Environmental Determination:

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Impact: Less than Significant Impact

The proposed Project would develop the Project site and install new utility connections to the existing utility infrastructure. Water and sewer will be served by EMWD. There is an existing 8-inch polyvinyl chloride (PVC) water pipeline along the northeast boundary of the site, perpendicular to Ramona Boulevard. The proposed Project would install 8-inch PVC branch water lines that would connect to the existing water pipeline. The new pipes would convey water to the proposed residences. The City has an existing 27-inch prestressed concrete pipe (PCP) sewer line along Ramona Boulevard. The proposed Project would install 8-inch PVC sewer lines throughout the site, connecting to the 27-inch sewer line.

Electric power will be served by Southern California Edison (SCE). Natural gas will be served by The Southern California Gas Company. Cable/broadband will be served by Time Warner. Telephone, FIOS TV/broadband will be served by Verizon.

Construction of new utility facilities and infrastructure for the proposed Project may have a temporary impact on air quality due to the use of offroad construction equipment and on road vehicles. Construction emissions impacts have been evaluated in the Air Quality Study included as Appendix A and discussed in Section 4.3.3. The Air Quality Study found that the emissions impacts related to project construction would be less than significant.

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b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Impact: Less than Significant Impact

A significant impact would occur if the proposed Project would increase water consumption to such a degree that the capacity of facilities currently serving the Project site would be exceeded. As discussed in Section 4.3.10, water supplies serving the Project site would be served by EMWD. The most recent UWMP prepared by EMWD in 2020 considers regional growth projections from the SCAG 2020 Connect SoCal. The 2020 Connect SoCal regional growth forecast was prepared based on General Plan Land Use designations.

Since the proposed Project is consistent with the City's General Plan Land Use designation, the proposed Project was included in EMWD's planning for future developments. Table 4-3 in the UWMP demonstrates projected demands for potable and raw water through 2045, which is reproduced as Table 4-22 below. As shown in Table 4-22, total demand for water in 2025 would be 102,600 acre-feet per year (AFY), increasing by 20% to 123,000 AFY in 2045. Total gross water use is provided in UWMP Table 4-5 and reproduced below as Table 4-23, which demonstrates EMWD would have a combined supply of 145,930 AFY in 2025 and a combined supply of 187,100 AFY in 2045. This provides an estimated surplus of 43,330 AFY in 2025 and a surplus of 61,100 AFY in 2045. Thus, sufficient water supplies are projected to serve the proposed Project, with projected surpluses as contingency against drought conditions. Impacts related to water supplies would be less than significant.

Table 4-22: Projected Demands for Potable and Raw Water

Use Type	Additional Description	Projected Water Use				
		2025	2030	2035	2040	2045
Single Family	Potable Water	66,900	71,700	76,700	80,500	84,000
Multi-Family		8,500	9,100	9,700	10,200	10,600
Commercial		6,100	6,500	7,000	7,300	7,600
Industrial		600	600	700	700	700
Institutional/Governmental		2,700	2,900	3,100	3,200	3,400
Landscape		8,400	7,600	6,800	6,200	5,500
Agricultural Irrigation		1,500	1,500	1,500	1,500	1,500
Agricultural Irrigation	Raw Water	500	500	500	500	500
Other		0	0	0	0	0
Non-Revenue	System losses & unbilled, authorized consumption	7,400	7,900	8,400	8,800	9,200
TOTAL:		**102,600**	**108,300**	**114,400**	**118,900**	**123,000**

1) Passive water savings due to the provisions outlined in the Administrative Code are included in the demand projections for EMW's retail service area.

2) Landscape demands remain constant/decrease over time as landscape accounts are offset by conversion to the recycled water system.

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3) Projections for losses in the table include system losses (real and transparent) and unbilled, authorized consumption.

Table 4-23: Total Gross Water Use

–	2020	2025	2030	2035	2040	2045
Potable and Raw Water From Table 4-1R and 4-2R	84,673	102,600	108,300	114,400	118,900	123,000
Recycled Water Demand* From Table 6-4R	31,243	43,330	49,020	54,500	59,800	64,100
TOTAL WATER USE:	**115,916**	**145,930**	**157,320**	**168,900**	**178,700**	**187,100**

c) Result in a determination by the waste water treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Impact: Less than Significant Impact

Wastewater treatment services are provided by EMWD. Wastewater from the Project site would be conveyed to the San Jacinto Valley Regional Water Reclamation Facility, which has typical daily flows of 7 million gallons per day (MGD), a current capacity of 14 MGD, and an ultimate capacity of 27 MGD (EMWD 2021). Thus, the plant currently has an additional capacity of 7 MGD and a future additional capacity of 13 MGD.

EMWD's 2015 Wastewater Collection System Master Plan Update calculate average dry weather flow (ADWF) by multiplying the number of equivalent dwelling units (EDUs) per land parcel by a rate of 235 gallons per day/EDU (EMWD 2015). The Wastewater Collection System Master Plan Update identifies those single-family residences with an average density of 4.5 dwelling units/acre generate 1 EDU/dwelling unit. Therefore, the 206 single-family residences developed by this proposed Project would generate approximately 43,000 gallons per day (0.043 MGD), which is within the existing and future capacity of the San Jacinto Valley Regional Water Reclamation Facility. Therefore, impacts on wastewater system capacity would be less than significant.

d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Impact: Less than Significant Impact

According to the General Plan, the City disposes of its waste in the Lamb Canyon Landfill. Lamb Canyon Sanitary Landfill is permitted to accept 5,000 tons per day of solid waste and is estimated to have an operations cease date of April 1, 2032. According to CalRecycle, the facility has a remaining capacity of 19,242,950 tons, or about 1.825 million tons per year on a daily basis for the remaining life of the facility.

The CalEEMod analysis estimated that operation of the proposed Project would generate approximately 108 tons of solid waste per year with recycling and diversion programs implemented, which represents a 50% reduction compared to traditional solid waste disposal. In context with the Lamb Canyon Landfill annual capacity, this rate represents

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approximately 0.006% of capacity, which can be considered de minimis. Thus, the solid waste generation impact would be less than significant.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Impact: No Impact

A significant impact could occur if a project would generate solid waste that was not disposed of in accordance with applicable regulations. These regulations include:

- California Integrated Waste Management Act of 1989 (AB 939). AB 939 requires cities and counties to reduce the amount of solid waste entering existing landfills through recycling, reuse, and waste prevention efforts. These efforts have included permitting procedures for waste haulers and handlers.
- San Jacinto incorporates the CALGreen Code, which is applicable to the construction of new buildings, by addressing construction waste reduction, disposal, and recycling. Demolition and construction activities would recycle or reuse a minimum of 65% of the non-hazardous construction and demolition waste.
- AB 341 requires diversion of a minimum of 75% of operational solid waste.

The proposed Project would comply with federal, state, and local statutes and regulations relating to solid waste. The proposed Project would not have any adverse impacts on compliance.

Mitigation Measures:

None required.

4.3.20 Wildfires

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XX. Wildfire. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☑
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the	☐	☐	☐	☑

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Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
uncontrolled spread of a wildfire?				
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☑
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☑

Environmental Determination:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

Impact: No Impact

The Project site is not located in or near State responsibility areas or lands classified as very high fire hazard zones. As this project is not vulnerable to such hazards but evacuation plan is still needed for any kind of emergency. This project is already surrounded by an open park and open spaces at another side makes it feasible for evacuation and an evacuation plan will be provided and shared with the community to respond and evacuate themselves in case of emergency.

The Project site does not include wildlands or high-fire-hazard terrain. As such, no impacts would occur, and no mitigation is required.

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

Impact: No Impact

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The Project site is located on flat terrain nor is it adjacent to sloped terrain. The Project site does not include wildlands or high-fire-hazard terrain. As such, no impacts would occur, and no mitigation is required.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Impact: No Impact

The Project site is not located in or near State Responsibility Areas or lands classified as very high fire hazard zones. Additionally, the proposed Project does not include any infrastructure that would exacerbate fire risks. The proposed Project would construct internal streets and install compliant fire suppression facilities (e.g., hydrants and sprinklers) that conform to the California Fire Code requirements, included as required per Municipal Code Chapter 8.16, Property Maintenance and Nuisance Abatement as verified through the City's permitting process. Further, electrical utilities inside the development would be underground, eliminating fire risks associated with overhead power lines. Therefore, impacts related to infrastructure that could exacerbate fire risks would not occur with the proposed Project.

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

Impact: Less than Significant

The Project site is not located in or near State Responsibility Areas (SRA) or lands classified as very high fire hazard zones. Based on Hazard Mapping, the Project site and nearby parcels are located on flat terrain and is considered as safe from flooding and is not located in or near a river bed. But for storm water a proper sewage design is required and no mitigation is required as such based on hazard map which is designed and studies geologically. The proposed Project would construct bioretention basins to convey stormwater from the Project site to reduce the risks of flooding. Therefore, no impacts are anticipated.

Mitigation Measures:

None required.

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4.3.21 Mandatory Findings of Significance

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XXI. Mandatory Findings of Significance.				
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☑	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☑	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☑	☐

Environmental Determination:

a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Impact: Less Than Significant Impact with Mitigation Incorporated

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The proposed Project was evaluated and is not expected to substantially degrade the quality of the environment, have significant impacts on biological resources, affect important cultural resources, or impair public services. Further, related to these resource areas, this focused IS found that the proposed Project would not have significant impacts on air quality due to combustion emissions, odors, or generation of fugitive dust. The proposed Project is expected to have a less than significant impact.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

Impact: Less Than Significant Impact with Mitigation Incorporated

CEQA Guidelines Section 15065(a) states that a Lead Agency shall consider whether the cumulative impact of a project is significant and whether the effects of the project are cumulatively considerable. The assessment of the significance of the cumulative effects of a project must, therefore, be conducted in connection with the effects of past projects, other current projects, and probable future projects. Due to the nature of the proposed Project and consistency with environmental policies, incremental contributions to impacts are considered less than cumulatively considerable. The proposed Project would not contribute substantially to adverse cumulative conditions or create any substantial indirect impacts.

As described in the impact analyses above, there would be either no impacts or less than significant impacts across all topical areas with applicable BMPs implemented, except for 4.3.4 Biological Resources, 4.3.5 Cultural Resources (including 4.3.18 Tribal Cultural Resources), and 4.3.15 Public Services. The mitigation measures MM-BIO-1, MM-CUL-1, MM-CUL-2, MM-CUL-3, MM-CUL-4, MM-PS-1, and MM-PS-2 would be needed for achieving less than significant impacts.

All other pending, approved, and completed projects in the vicinity of the proposed Project would be subject to review in separate environmental documents and required to conform to the City of San Jacinto General Plan and Municipal Code, mitigate for project-specific impacts, and provide appropriate engineering to ensure the development meets all applicable federal, State, and local regulations and codes. As currently designed, and by complying with applicable codes and regulations, the proposed Project would not contribute to a cumulative impact. Thus, the cumulative impacts of pending, approved, and completed projects would be less than cumulatively considerable and have a less than significant impact.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Impact: Less Than Significant Impact

The ways in which people can be subject to adverse effects from the proposed Project include possible exposure to engine exhaust emissions and fugitive dust, possible exposure to hazardous materials, and possible exposure to noise and traffic hazards. The analyses of environmental issues contained in this focused IS indicate that the Project is not expected

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to have probable or substantial impacts on human beings, either directly or indirectly. A less than significant impact is predicted for this checklist item.

Mitigation Measures:

As determined in the Sections I through XX impact analyses, with implementation of applicable BMPs, and implementation of mitigation measures MM-BIO-1, MM-CUL-1, MM-CUL-2, MM-CUL-3, MM-CUL-4, MM-PS-1, and MM-PS-2, no other mitigation measures are needed for the proposed Project.

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APPENDIX A – AIR QUALITY, GHG, NOISE, AND ENERGY STUDY

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October 13, 2021

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Subject: Air Quality, Greenhouse Gas, Noise, and Energy Impact Study for a Single-Family Residential Development Project in San Jacinto, CA

Dear Mr. Tang:

Yorke Engineering, LLC (Yorke) is pleased to provide this Air Quality (AQ), Greenhouse Gas (GHG), Noise, and Energy Impact Letter Report. This AQ/GHG/Noise/Energy Impact Letter Report includes CalEEMod emissions estimates, criteria pollutant analysis, localized significance level (LST) analysis, GHG analysis, noise analysis, and energy impact analysis for the proposed residential development in the City of San Jacinto, California (City). These evaluations will support the Applicant's submittal of a CEQA Categorical Exemption (CATX), Initial Study (IS), Negative Declaration (ND), or a Mitigated Negative Declaration (MND), as applicable.

PROJECT DESCRIPTION

Golden Ocean, LLC is proposing to develop 37.87 acres with 184 single-family homes to be located near the intersection of North Ramona Boulevard and Ranch View Lane in the city of San Jacinto, CA (the City), which is within the SCAQMD. The project site currently consists of three vacant parcels [APNs: 436-030-001 (portion), 436-040-006, and 436-040-008] to be developed with homes, roads, sidewalks, utilities, and open spaces. The minimum lot size is 4,800 square feet. Since the site is vacant, site preparation and grading activities are expected to be typical for the flat parcel. Demolition and excavation is not required. The site is not near any airports or freeways that could cause noise impacts on residents. In order to meet City of San Jacinto Planning Division requirements, an air quality, GHG, noise, and energy impact assessment is required.

ASSUMPTIONS

The following basic assumptions were used in developing the emission estimates for the proposed Project using the California Emissions Estimator Model® (CalEEMod):

- Some project design features including lot size of residential homes were defined by the Applicant;
- No hearths will be installed;
- Low VOC paint will be used;
- Low flow plumbing fixtures, drought-tolerant landscaping, and efficient irrigation systems will be used to conserve water and reduce associated electric power usage;
- Energy-efficient lighting, HVAC, and appliances to reduce electric power usage;

- CalEEMod default construction equipment categories, including daily operating hours, were applied to construction phases of the project;
- CalEEMod was run using the default construction schedule, comprising five construction phases (site preparation, grading, building construction, paving and architectural coating); and
- During construction, exposed soil will be watered three times daily and access roads will be swept on a daily basis during site preparation and grading activities.

LIST OF TABLES

The project analyses and results are summarized in the following tables:

- Table 1: Land Use Data for CalEEMod Input – Golden Ocean Realty, LLC
- Table 2: SCAQMD CEQA Thresholds of Significance
- Table 3: Construction Emissions Summary and Significance Evaluation
- Table 4: Operational Emissions Summary and Significance Evaluation
- Table 5: Construction Localized Significance Threshold Evaluation
- Table 6: Operational Localized Significance Threshold Evaluation
- Table 7: Greenhouse Gas Emissions Summary and Significance Evaluation
- Table 8: Typical Sound Level Characteristics
- Table 9: FHWA Noise Reference Levels and Usage Factors
- Table 10: Estimated Peak Activity Daytime Noise Impacts – Residential Receptors
- Table 11: Construction Mobile Source Energy Use – CalEEMod Basis
- Table 12: Operational Area and Mobile Source Energy Use – CalEEMod Basis
- Table 13: Operational Utility Energy Use – CalEEMod Basis

AIR QUALITY AND GREENHOUSE GAS IMPACTS ANALYSES

Appendix G of the California Environmental Quality Act (CEQA) Guidelines contains an Environmental Checklist Form which consists of a series of questions that are intended to encourage a thoughtful assessment of impacts. In order to evaluate the questions in the Air Quality and Greenhouse Gas Emissions Sections of the checklist, quantitative significance criteria established by the local air quality agency, such as SCAQMD, may be relied upon to make significance determinations based on mass emissions of criteria pollutants and GHGs, as determined in this report.

Project Emissions Estimation

The construction and operation analysis were performed using CalEEMod® (California Emissions Estimation Model, version 2020.4.0), the official statewide land use computer model designed to provide a uniform platform for estimating potential criteria pollutant and GHG emissions associated with both construction and operations of land use projects under CEQA. The model quantifies direct emissions from construction and operations (including vehicle use), as well as

indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. The mobile source emission factors used in the model – published by the California Air Resources Board (CARB) – include the Pavley standards and Low Carbon Fuel standards. The model also identifies project design features, regulatory measures, and mitigation measures to reduce criteria pollutant and GHG emissions along with calculating the benefits achieved from the selected measures. CalEEMod was developed by the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the SCAQMD, the Bay Area Air Quality Management District (BAAQMD), the San Joaquin Valley Air Pollution Control District (SJVAPCD), and other California air districts. Default land use data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) were provided by the various California air districts to account for local requirements and conditions. As the official assessment methodology for land use projects in California, CalEEMod is relied upon herein for construction and operational emissions quantification, which forms the basis for the impact analysis.

Based on information received from the Applicant, land use data used for CalEEMod input is presented in Table 1. The SCAQMD quantitative significance thresholds shown in Table 2 were used to evaluate project emissions impacts (SCAQMD 2019).

Table 1: Land Use Data for CalEEMod Input - Golden Ocean Realty, LLC

Project Element	Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage (footprint)	Floor Surface Area
Residential Development	Residential	Single Family Housing	184	Dwelling Unit	23.23	331,200
Streets & Sidewalks	Parking	Other Asphalt Surfaces	494.3	1,000 sq. ft.	11.35	494,300
Open Spaces	Parking	Other Non-Asphalt Surfaces	143.5	1,000 sq. ft.	3.29	143,500
Project Site					**37.87**	**969,000**

Source: Applicant 2021, CalEEMod version 2020.4.0

Notes:

Electric Utility - Southern California Edison

Climate Zone 10

1 acre = 43,560 sf

Source-receptor area Zone 28 – Hemet/San Jacinto Valley

Table 2: SCAQMD CEQA Thresholds of Significance		
Pollutant	**Project Construction**	**Project Operation**
ROG (VOC)	75 lbs/day	55 lbs/day
NO_X	100 lbs/day	55 lbs/day
CO	550 lbs/day	550 lbs/day
SO_X	150 lbs/day	150 lbs/day
PM_{10}	150 lbs/day	150 lbs/day
$PM_{2.5}$	55 lbs/day	55 lbs/day
24-hour $PM_{2.5}$ Increment	10.4 µg/m^3	2.5 µg/m^3
24-hour PM_{10} Increment	10.4 µg/m^3	2.5 µg/m^3
Annual PM_{10} Increment	1.0 µg/m^3 annual average	
1-hour NO_2 Increment	0.18 ppm (state)	
Annual NO_2 Increment	0.03 ppm (state) & 0.0534 ppm (federal)	
1-hour SO_2 Increment	0.25 ppm (state) & 0.075 ppm (federal – 99th percentile)	
24-hour SO_2 Increment	0.04 ppm (state)	
24-hour Sulfate Increment	25 ug/m^3 (state)	
1-hour CO Increment	20 ppm (state) & 35 ppm (federal)	
8-hour CO Increment	9.0 ppm (state/federal)	
Toxic Air Contaminants (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥10 in 1 million	
	Cancer Burden >0.5 excess cancer cases (in areas ≥1 in 1 million)	
	Chronic & Acute Hazard Index ≥1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to Rule 402	
Greenhouse Gases	10,000 MT/yr CO_2e for industrial facilities	
	3,000 MT/yr CO_2e for land use projects (draft proposal)	

Source: SCAQMD 2019, 2008b

Criteria Pollutants from Project Construction

A project's construction phase produces many types of emissions, generally PM_{10} (including $PM_{2.5}$) in fugitive dust and diesel engine exhaust are the pollutants of greatest concern. Construction activities will include construction of 4 levels. Construction-related emissions can cause substantial increases in localized concentrations of PM_{10}, as well as affecting PM_{10} compliance with ambient air quality standards on a regional basis. The use of diesel-powered construction equipment emits ozone precursors oxides of nitrogen (NO_x) and reactive organic gases (ROG), and diesel particulate matter (DPM). Use of architectural coatings and other materials associated with finishing buildings may also emit ROG and Toxic Air Contaminants (TACs). CEQA significance thresholds address the impacts of construction activity emissions on local and regional air quality. Thresholds are also provided for other potential impacts related to project construction, such as odors and TACs.

The SCAQMD's approach to CEQA analyses of fugitive dust impacts is to require implementation of effective and comprehensive dust control measures rather than to require detailed quantification of emissions. PM_{10} emitted during construction can vary greatly depending on the level of activity,

the specific operations taking place, the equipment being operated, local soils, weather conditions, and other factors, making quantification difficult. Despite this variability in emissions, experience has shown that there are several feasible control measures that can be reasonably implemented to significantly reduce fugitive dust emissions from construction. For larger projects, the SCAQMD has determined that compliance with an approved fugitive dust control plan comprising Best Management Practices (BMPs), primarily through frequent water application, constitutes sufficient preventive measures to reduce PM_{10} impacts to a level considered less than significant.

Criteria Pollutants from Project Operation

The term "project operations" refers to the full range of activities that can or may generate criteria pollutant, GHG, and TAC emissions when the project is functioning in its intended use. For projects, such as office parks, shopping centers, apartment buildings, residential subdivisions, and other indirect sources, motor vehicles traveling to and from the project represents the primary source of air pollutant emissions. For industrial projects and some commercial projects, equipment operation and manufacturing processes, i.e., permitted stationary sources, can be of greatest concern from an emissions standpoint. CEQA significance thresholds address the impacts of operational emission sources on local and regional air quality. Thresholds are also provided for other potential impacts related to project operations, such as odors.

Results of Criteria Emissions Analyses

Table 3 shows unmitigated and mitigated criteria construction emissions and evaluates mitigated emissions against SCAQMD significance thresholds.

Table 4 shows unmitigated and mitigated criteria operational emissions and evaluates mitigated emissions against SCAQMD significance thresholds.

As shown in Tables 3 and 4, mass emissions of criteria pollutants from construction and operation are below applicable SCAQMD significance thresholds.

PROJECTED IMPACT: Less Than Significant (LTS)

MITIGATION: None required

Table 3: Construction Emissions Summary and Significance Evaluation				
Criteria Pollutants	**Unmitigated (lbs/day)**	**Mitigated (lbs/day)**	**Threshold (lbs/day)**	**Significance**
ROG (VOC)	41.3	41.3	75	LTS
NO_X	38.9	38.9	100	LTS
CO	31.5	31.5	550	LTS
SO_X	0.1	0.1	150	LTS
Total PM_{10}	21.2	9.3	150	LTS
Total $PM_{2.5}$	11.6	5.4	55	LTS

Sources: SCAQMD 2019, CalEEMod version 2020.4.0

Notes:

lbs/day are winter or summer maxima for planned land use

Total PM_{10} / $PM_{2.5}$ comprises fugitive dust plus engine exhaust

LTS - Less Than Significant

Table 4: Operational Emissions Summary and Significance Evaluation				
Criteria Pollutants	**Unmitigated (lbs/day)**	**Mitigated (lbs/day)**	**Threshold (lbs/day)**	**Significance**
ROG (VOC)	13.0	13.0	55	LTS
NO_X	8.2	8.1	55	LTS
CO	65.0	64.0	550	LTS
SO_X	0.1	0.1	150	LTS
Total PM_{10}	12.9	12.9	150	LTS
Total $PM_{2.5}$	3.7	3.6	55	LTS

Sources: SCAQMD 2019, CalEEMod version 2020.4.0

Notes:

lbs/day are winter or summer maxima for planned land use

Total PM_{10} / $PM_{2.5}$ comprises fugitive dust plus engine exhaust

LTS - Less Than Significant

Localized Significance Threshold Analysis

The SCAQMD's Localized Significance Threshold (LST) methodology (2008a) was used to analyze the neighborhood scale impacts of NO_X, CO, PM_{10}, and $PM_{2.5}$ associated with project-specific mass emissions. Introduced in 2003, the LST methodology was revised in 2008 to include the $PM_{2.5}$ significance threshold methodology and update the LST mass rate lookup tables for the new 1-hour NO_2 standard.

For determining localized air quality impacts from small projects in a defined geographic source-receptor area (SRA), the LST methodology provides mass emission rate lookup tables for 1-acre, 2-acre, and 5-acre parcels by SRA. The tabulated LSTs represent the maximum mass emissions from a project that will not cause or contribute to an exceedance of state or national ambient air quality standards (CAAQS or NAAQS) for the above pollutants and were developed based on ambient concentrations of these pollutants for each SRA in the South Coast Air Basin. (SCAQMD 2008a)

The proposed Project site is 37.87 acres in source-receptor area Zone 28 – Hemet/San Jacinto Valley. The 5-acre screening lookup tables were used to evaluate NO_x, CO, PM_{10}, and $PM_{2.5}$ impacts on nearby receptors. The nearest receptor is approximately 50 meters (165 feet) away from the site boundary. Therefore, the impact evaluation was performed using 50 meters for construction and operation. For operational mobile sources (e.g., residents' and workers' personal vehicles and deliveries), localized fugitive road dust (PM_{10}/$PM_{2.5}$) impacts nearest to the project site were evaluated against the LST thresholds. (SCAQMD 2008a)

Results of Localized Significance Threshold Analysis

The LST results provided in Tables 5 and 6 show that on-site emissions from construction and operations would meet the LST passing criteria at the nearest receptors (50 meters). Thus, impacts would be less than significant.

PROJECTED IMPACT: Less Than Significant (LTS)

MITIGATION: None required

Table 5: Construction Localized Significance Threshold Evaluation				
Criteria Pollutants	**Mitigated (lbs/day)**	**Threshold (lbs/day)**	**Percent of Threshold**	**Result**
NO_X	38.9	416	9%	Pass
CO	31.5	2,714	1%	Pass
PM_{10}	9.3	40	23%	Pass
$PM_{2.5}$	5.4	10	54%	Pass

Sources: SCAQMD 2008a, CalEEMod version 2020.4.0

Notes:

Source-receptor area Zone 28 – Hemet/San Jacinto Valley

5-acre area, 50 meters to receptor

Table 6: Operations Localized Significance Threshold Evaluation				
Criteria Pollutants	**Mitigated (lbs/day)**	**Threshold (lbs/day)**	**Percent of Threshold**	**Result**
NO_X	8.1	416	2%	Pass
CO	64.0	2,714	2%	Pass
PM_{10}	1.5	10	15%	Pass
$PM_{2.5}$	0.5	3	18%	Pass

Sources: SCAQMD 2008a, CalEEMod version 2020.4.0

Notes:

Mobile source PM_{10} & $PM_{2.5}$ emissions encompass 1 mile radius of project site

Source-receptor area Zone 28 – Hemet/San Jacinto Valley

5-acre area, 50 meters to receptor

Greenhouse Gas Emissions from Construction and Operation

Greenhouse gases – primarily carbon dioxide (CO_2), methane (CH_4), and nitrous (N_2O) oxide, collectively reported as carbon dioxide equivalents (CO_2e) – are directly emitted from stationary source combustion of natural gas in equipment such as water heaters, boilers, process heaters, and furnaces. GHGs are also emitted from mobile sources such as on-road vehicles and off-road construction equipment burning fuels such as gasoline, diesel, biodiesel, propane, or natural gas (compressed or liquefied). Indirect GHG emissions result from electric power generated elsewhere (i.e., power plants) used to operate process equipment, lighting, and utilities at a facility. Also, included in GHG quantification is electric power used to pump the water supply (e.g., aqueducts, wells, pipelines) and disposal and decomposition of municipal waste in landfills. (CARB 2017)

California's Building Energy Efficiency Standards are updated on an approximately three-year cycle. The 2019 standards improved upon the 2016 standards for new construction of, and additions and alterations to, residential, commercial, and industrial buildings. The 2019 standards went into effect on January 1, 2020 (CEC 2019).

Since the Title 24 standards require energy conservation features in new construction (e.g., high-efficiency lighting, high-efficiency heating, ventilating, and air-conditioning (HVAC) systems,

thermal insulation, double-glazed windows, water conserving plumbing fixtures, etc.), they indirectly regulate and reduce GHG emissions.

Using CalEEMod, direct onsite and offsite GHG emissions were estimated for construction and operation, and indirect offsite GHG emissions were estimated to account for electric power used by the proposed Project, water conveyance, and solid waste disposal.

Results of Greenhouse Gas Emissions Analyses

The SCAQMD officially adopted an industrial facility mass emissions threshold of 10,000 metric tons (MT) CO_2e per year (SCAQMD 2019) and has proposed a draft residential/commercial mass emissions threshold of 3,000 metric tons (MT) CO_2e per year (SCAQMD 2008b).

Table 7 shows unmitigated and mitigated GHG emissions and evaluates mitigated emissions against SCAQMD significance thresholds. Operational measures incorporate typical code-required energy and water conservation features. Off-site traffic impacts are included in these emissions estimates, along with construction emissions amortized over 30 years.

As shown in Table 7, mitigated GHG emissions are below the proposed GHG significance threshold for land use projects.

PROJECTED IMPACT: Less Than Significant (LTS)

MITIGATION: None required

Table 7: Greenhouse Gas Emissions Summary and Significance Evaluation

Greenhouse Gases	Unmitigated (MT/yr)	Mitigated (MT/yr)	Threshold (MT/yr)	Significance
CO_2	2,594	2,545	—	—
CH_4	3.1	1.7	—	—
N_2O	0.1	0.1	—	—
CO_2e	2,704	2,621	3,000	LTS

Sources: SCAQMD 2008b, CalEEMod version 2020.4.0

Notes:

Comprises annual operational emissions plus construction emissions amortized over 30 years

LTS - Less Than Significant

NOISE IMPACTS ANALYSES

Noise Analysis Methodology

The screening-level noise analysis for Project construction was completed based on methodology developed by the U.S. Department of Transportation Federal Highway Administration (DOT FHWA) at the John A. Volpe National Transportation Systems Center and other technical references consistent with CalEEMod™ outputs (equipment utilization). The DOT FHWA methodology uses actual noise measurement data collected during the Boston "Big Dig" project (1991-2006) as reference levels for a wide variety of construction equipment in common use, such as on the proposed Project. This noise analysis did not include field measurements of ambient noise in the vicinity of the Project site.

The FHWA noise model provides relatively conservative predictions because it does not account for site-specific geometry, dimensions of nearby structures, and local environmental conditions that can affect sound transmission, reflection, and attenuation. As a result, actual measured sound levels at receptors may vary somewhat from predictions, typically lower. Additionally, the impacts of noise upon receptors (persons) are subjective because of differences in individual sensitivities and perceptions.

Noise impacts were evaluated against community noise standards contained in the City or County General Plan or other state or federal agency as applicable to the vicinity of the Project site. For this Project, the City of San Jacinto General Plan Noise Element contains the applicable evaluation criteria.

During construction activities, the Project would generate noise due to operation of minimal off-road equipment, portable equipment, and vehicles at or near the Project site. No significant increase in traffic is expected due to this relatively small project. No strong sources of vibrations are planned to be used during construction activities.

Since the Project is near an urban street, the incremental effect of Project operation (possible slightly increased traffic) would not be quantifiable against existing traffic noise (background) in the Project vicinity (i.e., less than significant impact). Also, since no public or private use airport is closer than 2 miles from the Project site, an evaluation of aircraft noise upon persons residing or working in the Project area is not required.

Environmental Setting

Noise Descriptors

Noise is typically described as any dissonant, unwanted, or objectionable sound. Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Because the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity, the A-weighted decibel scale (dBA). Table 8 lists common sources of sound and their intensities in dBA.

Table 8: Typical Sound Level Characteristics		
Pressure (N/m^2)	**Level (dBA)**	**Sound Level Characteristic**
2000	160	Rocket Launch
600	150	Military Jet Plane Takeoff
200	140	Threshold of Pain
60	130	Commercial Jet Plane Takeoff
20	120	Industrial Chipper or Punch Press
6	110	Loud Automobile Horn
2	100	Passing Diesel Truck – Curb Line
0.6	90	Factory - Heavy Manufacturing
0.2	80	Factory - Light Manufacturing
0.06	70	Open Floor Office - Cubicles
0.02	60	Conversational Speech
0.006	50	Private Office - Walled
0.002	40	Residence in Daytime
0.0006	30	Bedroom at Night
0.0002	20	Recording or Broadcasting Studio
0.00006	10	Threshold of Good Hearing - Adult
0.00002	0	Threshold of Excellent Hearing - Child

Sources: Broch 1971, Plog 1988

Notes:

Reference Level $P_O = 0.00002\ N/m^2 = 0.0002\ \mu bar$

N/m^2 = Newtons per square meter (the Newton is the unit of force derived in the metric system); it is equal to the amount of net force required to accelerate one kilogram of mass at a rate of one meter per second squared (1 kg • 1 m/s^2) in the direction of the applied force.

In most situations, a 3-dBA change in sound pressure is considered a "just-detectable" difference. A 5-dBA change (either louder or quieter) is readily noticeable, and 10-dBA change is a doubling (if louder) or halving (if quieter) of the subjective loudness. Sound from a small, localized source (a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates (drops off) at a rate of 6 dBA for each doubling of the distance.

The duration of noise and the time period at which it occurs are important factors in determining the impact of noise on sensitive receptors. A single number called the equivalent continuous noise level (L_{eq}) may be used to describe sound that is changing in level. It is also used to describe the acoustic range of the noise source being measured, which is accomplished through the maximum L_{eq} (L_{max}) and minimum L_{eq} (L_{min}) indicators.

In determining the daily measure of community noise, it is important to account for the difference in human response to daytime and nighttime noise. Noise is more disturbing at night than during the day, and noise indices have been developed to account for the varying duration of noise events over time, as well as community response to them. The Community Noise Equivalent Level (CNEL) adds a 5-dB penalty to the "nighttime" hourly noise levels (HNLs) (i.e., 7:00 p.m. to 10:00

p.m.) and the Day-Night Average Level (L_{dn}) adds a 10-dB penalty to the evening HNLs (Caltrans 2020, FTA 2006).

Vibration Descriptors

Vibration is a unique form of noise because its energy is carried through structures and the earth, whereas noise is carried through the air. Thus, vibration is generally felt rather than heard. Typically, ground borne vibration generated by manmade activities attenuates rapidly as distance from the source of the vibration increases. Actual human and structural response to different vibration levels is influenced by a combination of factors, including soil type, distance between the source and receptor, duration, and the number of perceived events.

While not a direct health hazard, the energy transmitted through the ground as vibration may result in structural damage, which may be costly to repair and dangerous in the event of structural failure. To assess the potential for structural damage associated with vibration, the vibratory ground motion in the vicinity of the affected structure is measured in terms of point peak velocity/peak particle velocity (PPV) in the vertical and horizontal directions (vector sum). A freight train passing at 100 feet may cause PPVs of 0.1 inch per second, while a strong earthquake may produce PPVs in the range of 10 inches per second. Minor cosmetic damage to buildings may begin in the range of 0.5 inch per second (Caltrans 2020, FTA 2006).

Regulatory Setting

California

The State of California does not promulgate statewide standards for environmental noise but requires each city and county to include a noise element in its general plan [California Government Code Section 65302(f)]. In addition, Title 4 of the CCR has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. In general, the guidelines require that community noise standards:

- Protect residents from the harmful and annoying effects of exposure to excessive noise;
- Prevent incompatible land uses from encroaching upon existing or programmed land uses likely to create significant noise impacts; and
- Encourage the application of state-of-the-art land use planning methodologies in the area of managing and minimizing potential noise conflicts.

Construction vibration is regulated at the state level in accordance with standards established by the *Transportation and Construction-Induced Vibration Guidance Manual* issued by Caltrans in 2004. Continuous sources include the use of vibratory compaction equipment and other construction equipment that creates vibration other than in single events. Transient sources create a single isolated vibration event, such as blasting. Thresholds for continuous sources are 0.5 and 0.1 inch per second PPV for structural damage and annoyance, respectively. Thresholds for transient sources are 1.0 and 0.9 PPV for structural damage and annoyance, respectively (Caltrans 2020).

City of San Jacinto General Plan – Noise Element

For this Project, the Noise Element of the City of San Jacinto General Plan contains the applicable evaluation criteria. The Construction Standards section of the noise element contains the applicable

standards for this project. The proposed Project can be characterized as a new residential development on a vacant plot of land. Most noise would occur during the grading, site preparation and building construction when heavy equipment would be operating.

During each of the five construction phases there would be a different mix of equipment operating and cumulative noise levels would vary based on the amount of equipment in operation and the location of each activity at the Project site. In general, use of off-road equipment and portable equipment would generate noise due to engine mechanicals, engine exhaust, driveline mechanicals, shaft-driven devices and accessories, hydraulics operation, ground friction and displacement, and gravity drops (dumping, unloading).

Since no intense percussive actions (e.g., hard rock-breaking, large pile-driving) are planned to occur during the site work, no strong ground-borne vibrations are expected to be generated that could affect nearby structures or be noticeable to their occupants.

The Project is expected to require up to approximately 44 months of planned work activities (i.e., from mobilization to substantial completion) comprising five construction phases:

1) Site Preparation
2) Grading
3) Building construction
4) Paving
5) Architectural coating.

The nearest receptors are located an average distance of about 100 meters (330 feet) from the central construction zone where equipment noise would typically emanate from. All proposed construction activities for the project will take place in daylight during regular business hours. Construction is not expected to occur between the hours of 6:00 pm and 7:00 am for the duration of the project. Deviations from this operating schedule would not affect the noise analysis because noise does not persist or accumulate in the environment.

Results of Construction Screening Noise Analysis

Types of equipment (FHWA 2006) to be used during the Project and noise-emitting characteristics (i.e., usage factors, reference dBA, and percussive source) are shown in Table 9 consistent with CalEEMod outputs (Attachment 1).

The City of San Jacinto General Plan Noise Element (City 2006), contains noise standards for residential living spaces. For residential living spaces, an indoor CNEL limit (threshold) of 45 dB[A] is considered acceptable. Table 10 shows a comparison of FHWA screening-level estimated daytime interior noise impacts for peak construction activities at nearby receptors with respect to the threshold. If the threshold is not exceeded, then a project should be considered acceptable, i.e., Less Than Significant.

Table 9: FHWA Noise Reference Levels and Usage Factors							
CalEEMod Construction Detail			FHWA Equipment Type	Ref.	Usage Factor	Ref. Level	Percussive Source
Phase Name	Equipment Description	Qty.			percent	dBA	Yes/No
Site Preparation (1)	Rubber Tired Dozers	3	Tractor (rubber tire)	1	40%	84	No
	Tractors/Loaders/Backhoes	4	Backhoe (with loader)	1	40%	80	No
Grading (2)	Excavators	2	Excavator (hydraulic)	1	40%	85	No
	Graders	1	Grader	1	40%	85	No
	Rubber Tired Dozers	1	Tractor (rubber tire)	1	40%	84	No
	Scrapers	2	Scraper	1	40%	85	No
	Tractors/Loaders/Backhoes	2	Backhoe (with loader)	1	40%	80	No
Building Construction (3)	Cranes	1	Crane	1	16%	85	No
	Forklifts	3	Forklift	1	40%	80	No
	Generator Sets	1	Generator (<25 KVA quiet design)	1	50%	70	No
	Tractors/Loaders/Backhoes	3	Backhoe (with loader)	1	40%	80	No
	Welders	1	Welding Machine (arc welding)	1	50%	70	No
Paving (4)	Pavers	2	Paver (asphalt)	1	50%	85	No
	Paving Equipment	2	Pavement Scarifier	1	20%	85	No
	Rollers	2	Roller	1	20%	85	No
Architectural Coating (5)	Air Compressors	1	Compressor (air)	1	40%	80	No

Source: CalEEMod version 2020.4.0, FHWA 2006

Table 10: Estimated Peak Activity Daytime Noise Impacts - Residential Receptors (mitigated)			
Construction Phases	Normal Acceptance Criteria (Residential Interior)		
	Modeled Noise Level (L_{eq} dBA)[a]	Significance Threshold (CNEL dBA)[b]	Exceeds Threshold (Yes/No)?
Background	40.2	45	No
Site Preparation	43.4	45	No
Grading	44.9	45	No
Building Construction	42.6	45	No
Paving	43.9	45	No
Architectural Coating	40.6	45	No
Long-Term Impact	40.2	45	No

Sources: CalEEMod version 2020.4.0, FHWA 2006, Broch 1971, Plog 1988, City 2006

Notes:

[a] Includes existing street traffic and ambient noise sources (cumulative impacts)

[b] Refer to applicable City or County General Plan Noise Element and Municipal Code Noise Ordinance for thresholds

Operational Noise

Upon completion of construction and occupancy of the proposed Project, on-site operational noise would be generated mainly by residential-grade heating, ventilation, and air conditioning (HVAC) equipment installed on the new buildings. However, the overall noise levels generated by the new HVAC equipment are not expected to be substantially greater than generated by older HVAC equipment installed on existing buildings near the Project site. As such, the new HVAC equipment associated with the proposed Project would not represent a substantially new type or source of noise in the general vicinity.

The proposed residential Project would not be a source of industrial noise. No adverse impacts are expected from, and no special noise mitigation measures would be required for, the operation of the proposed Project. Therefore, the operational noise impacts of the proposed Project would be less than significant.

Interior areas of the completed Project would not be adversely impacted by ambient (outdoor) urban noise because the Project would be constructed to meet applicable California Code of Regulations (CCR) Title 24 Parts 6 and 11 building energy efficiency standards (CEC 2019). Thermal insulation, e.g., fiberglass batting in exterior walls and double-pane windows, also attenuates sound transmission and thus would provide an acceptable interior noise environment, which is particularly important for sensitive land uses. Specifically, the proposed Project would be designed and constructed to maintain interior noise levels at or below a CNEL of 45 dBA in any normally occupied space of the Project with no other sources of interior noise operating, such as HVAC, appliances, power tools, or office equipment. As such, interior noise impacts of the proposed Project would be less than significant.

Analysis of Noise Significance Criteria

Noise impacts would be considered significant if any of the following criteria are met. Would the project result in:

a) *Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*

   No. As shown in the above analysis, temporary construction noise would be limited to daylight hours and would permanently cease upon completion of construction. Aggregated average construction noise is not expected to exceed 45 dBA at nearby residential receptors (interiors), which is below the unacceptable range. Operational noise sources for residential buildings, such as new residential-grade HVAC equipment, are of quiet design per commercial standards.

b) *Generation of excessive groundborne vibration or groundborne noise levels?*

   No. The proposed single family home foundations will be standard concrete slab design on a flat site. Only shallow excavation, trenching, and grading will be required for the foundations and utilities. Construction plans do not include intense percussive actions (e.g., hard rock-breaking, large pile-driving). Therefore, no strong ground-borne vibrations are expected to be generated that could affect nearby structures or be noticeable to their occupants.

c) *For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?*

Not applicable. No public or private use airport is within 2 miles of the Project site.

This study predicts a less than significant impact in accordance with the City of San Jacinto's General Plan.

PROJECTED IMPACT: Less Than Significant (LTS)

MITIGATION: None Required

ENERGY IMPACTS ANALYSES

Residential project energy consumption primarily comprises 1) mobile source fuels (i.e., diesel, gasoline) used for construction, 2) area and mobile source fuels used for operation (e.g., residents and deliveries), and 3) building utilities (direct natural gas and electric power, and indirect electric power).

Project Construction Fuel Consumption

The fuel consumption from the mobiles sources used for construction was calculated from the results of the CalEEMod modeling procedure. CalEEMod calculates mass emissions of GHGs, including CO_2, from offroad and onroad mobile sources associated with project construction. For construction, CalEEMod aggregates mobile source CO_2 emissions into four broad categories (typical fuel types assumed):

- Offroad equipment [diesel (Tiers 1-4)];
- Hauling [heavy-heavy duty diesel trucks (HHDT)];
- Vendor [medium-heavy and heavy-heavy duty diesel trucks (MHDT, HHDT)]; and
- Worker [light duty gasoline automobiles and trucks (LDA, LDT1, LDT2)].

For each category, diesel and gasoline fuel consumption can be estimated (back-calculated) using 2020 Climate Registry (40 CFR 98 Subpart C) emission factors for those fuels:

- Diesel Fuel Oil No. 2: 10.21 kg CO_2 per gallon [22.51 lbs CO_2 per gallon]; and
- Motor Gasoline: 8.78 kg CO_2 per gallon [19.36 lbs CO_2 per gallon].

Using the CalEEMod annual emissions results (MT CO_2) for each of the four mobile source categories (offroad, hauling, vendor, worker) and the corresponding CO_2 emission factors, Table 11 shows estimated fuel consumption during project construction. As shown in Table 11, based on CalEEMod, project construction could consume approximately 312,000 gallons of liquid fuels[1].

[1] For this project, no large-scale hauling is expected (i.e., no demolition or substantial earth import/export).

Table 11: Construction Mobile Source Energy Use – CalEEMod Basis					
Mobile Sources	**Types**	**Fuels**	**MT CO_2**	**CO_2 Emission Factor (kg/gal)**	**Fuel Consumption (gallons)**
Off-Road	Tiers 1-4	Diesel	1,174	10.21	115,000
Hauling[1]	HHDT	Diesel	0	10.21	0
Vendor	MHDT, HHDT	Diesel	772	10.21	75,600
Worker	LDA, LDT1, LDT2	Gasoline	1,066	8.78	121,400
Totals			**3,012**	—	**312,000**

Sources: CalEEMod version 2020.4.0, TCR 2020, 40 CFR 98 Subpart C

Project Operation Fuel Consumption

Similar to construction, CalEEMod calculates mass emissions of CO_2 from area and mobile sources associated with project operation. For operation, CalEEMod aggregates area and mobile source CO_2 emissions into three broad categories (typical fuel types assumed):

- Utility equipment [gasoline];
- Heavy Mobile [light-heavy, medium-heavy and heavy-heavy duty diesel trucks (LHDT, MHDT, HHDT)]; and
- Light Mobile [light and medium duty gasoline automobiles and trucks (LDA, LDT1, LDT2, MDV)].

For each category, diesel and gasoline fuel consumption can be estimated (back-calculated) using 2020 Climate Registry (40 CFR 98 Subpart C) emission factors for those fuels. Consistent with CalEEMod, residential land use operational vehicle fleet mixes comprise approximately 95% gasoline and 5% diesel fuel usage.

Using the CalEEMod annual emissions results (MT CO_2) for the area and mobile source categories and the corresponding CO_2 emission factors, Table 12 shows estimated fuel consumption during project operation. As shown in Table 12, based on CalEEMod, project operation could consume approximately 210,900 gallons of liquid fuels annually.

Table 12: Operational Area and Mobile Source Energy Use – CalEEMod Basis					
Sources	**Types**	**Fuels**	**MT CO_2 per year**	**CO_2 Emission Factor (kg/gal)**	**Fuel Consumption (gallons/year)**
Area	Utility Equipment	Gasoline	2.9	8.78	300
Heavy Mobile	LHDT, MHDT, HHDT	Diesel	93	10.21	9,100
Light Mobile	LDA, LDT1, LDT2, MDV	Gasoline	1,769	8.78	201,500
Totals			**1,865**	—	**210,900**

Sources: CalEEMod version 2020.4.0, TCR 2020, 40 CFR 98 Subpart C

Project Operation Utilities Consumption

Based on CalEEMod for the defined land use, Table 13 shows estimated natural gas and electric power usage for the proposed project. The amounts of natural gas and electricity used directly by residents is provided in the CalEEMod output. Natural gas usage is consistent with the SCAQMD-approved default higher heating value (HHV) of 1,050 BTU per cubic foot.

The indirect electric power associated with water used by residents is calculated from the CalEEMod indoor and outdoor water consumption results and CalEEMod energy intensity factors for water supply, water treatment, water distribution, and wastewater treatment as applicable.

As shown in Table 13, project operation would result in natural gas usage of approximately 4.76 million cubic feet per year (MMcf/year), and utilization of approximately 1,622 megawatt-hours per year (MWh/year) of electric power in aggregate.

Table 13: Operational Utility Energy Use – CalEEMod Basis

Component	Type	Quantity	Units
Home Utilities	Natural Gas	4.76	MMcf/year
Home Utilities	Electric Power	1,418	MWh/year
Water - Indoor Use	Electric Power	125	MWh/year
Water - Outdoor Use	Electric Power	79	MWh/year

Source: CalEEMod version 2020.4.0

Analysis of Energy Significance Criteria

Impacts to energy resources would be considered significant if any of the following criteria are met. Would the project:

a) *Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?*

No. The proposed energy use will not be done in a wasteful and/or inefficient manner. Project construction will be performed by contractors with an economic incentive to minimize costs, one element of which is fuel conservation, which would benefit profits. The residential project will be required by code (below) to minimize direct operational energy usage by means of thermal wall insulation, insulating double-pane windows, high-efficiency HVAC equipment, LED lighting, motion-detector light switches, Energy Star® appliances, and other modern energy-saving features. In addition, low-flow plumbing fixtures conserve both water and energy, as less electric power would be needed for water conveyance and treatment.

b) *Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?*

No. The project would not conflict with or obstruct any adopted energy conservation plans, state or local plans for renewable energy, or energy efficiency. The California Building Energy Efficiency Standards (California Code of Regulations, Title 24, Parts 6 and 11) are designed to reduce unnecessary energy consumption in newly constructed and existing buildings, such as residential and commercial structures. The Building Energy Efficiency Standards are applicable to the proposed project, which is designed for human habitation (CEC 2019). The proposed project would support plans for Level 2 electric vehicle charging stations to reduce fuel consumption and rooftop solar photovoltaic (PV) panels to

provide on-site renewable energy generation. Both of these measures would also reduce GHG emissions overall. Thus, the proposed project would not conflict with Title 24 or obstruct its implementation on applicable land use development projects in California.

PROJECTED IMPACT: Less Than Significant (LTS)

MITIGATION: None Required

CLOSING

Thank you very much for the opportunity to be of assistance to Golden Ocean Realty, LLC. Should you have any questions, please contact me at (805) 217-4947 (mobile).

Sincerely,

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Enclosures/Attachments:
CalEEMod Outputs

AIR QUALITY AND GHG REFERENCES

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APPENDIX B–BIOLOGICAL SURVEY

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GENERAL BIOLOGICAL ASSESSMENT
AND
WESTERN RIVERSIDE COUNTY MSHCP
CONSISTENCY ANALYSIS
FOR
TTM 38066

CITY OF SAN JACINTO, COUNTY OF RIVERSIDE, CALIFORNIA

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AUGUST 2023

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1.0 Introduction

HES was contracted to prepare a General Biological Assessment (GBA) and Western Riverside County MSHCP Consistency Analysis for TTM 38066 including Assessor's Parcel Numbers (APNs) 436-030-001, 436-040-006, and 436-040-008. The project site consists of approximately 37.87 acres located southwest of North Ramona Boulevard between Shimmering Way and Ranch View Lane in the City of San Jacinto, County of Riverside, California.

1.1 Project Site Location

The project site consists of Riverside County Assessor's Parcel Numbers (APNs) 436-030-001, 436-040-006, and 436-040-008. The 37.87-acre property is located southwest of North Ramona Boulevard, East of North Sanderson Avenue and northwest of Ranch View Lane in the City of San Jacinto, County of Riverside, California. Specifically, the project site is located in within San Jacinto Viejo land grant between the United States Geological Survey *San Jacinto* and *Lakeview* 7.5-Minute Quadrangles. The center point latitude and longitude coordinates for the project site are 33˚03'23.2332" North and 114˚56'42.7625" West (Figures 1 and 2, *Location Map* and *Vicinity Map*).

1.2 Project Description

The proposed project includes the construction of a single-family residential development. The proposed residential development will consist of 184 residential lots and three open space lots. The proposed project includes associated parking, landscaping, access roads, and utilities (Figure 3, *Project Plans*). The proposed residential development will impact the entire 37.87-acre project site.

2.0 Methodology

2.1 Literature Review

HES conducted a literature review and reviewed aerial photographs and topographic maps of the project site and surrounding areas. A five-mile radius was used to identify sensitive species with the California Natural Diversity Data Base (CNDDB), the U.S. Fish and Wildlife Service (USFWS) Endangered Species Lists, and the California Native Plant Society (CNPS) rare plant lists to obtain species information for the project area. The CNDDB and USFWS critical habitat databases were utilized, together with Geographic Information System (GIS) software, to locate the previously recorded locations of sensitive plant and wildlife occurrences and designated critical habitat and determine the distance from the project site. Additionally, the Western Riverside County MSHCP was reviewed for information on known occurrences of sensitive species within Riverside County.

2.1.1 Western Riverside County MSHCP

The Western Riverside County MSHCP (Dudek and Associates 2003) is a comprehensive, multijurisdictional habitat conservation planning program for western Riverside County, California. The purpose of the Western Riverside County MSHCP is to preserve native habitats, and to this end, the plan focuses upon the habitat needs of multiple species rather than one species at a time. The Western Riverside County MSHCP provides coverage/take authorization for some species listed under the federal or state Endangered Species Act (ESA) as well as non-listed special-status plant and wildlife species. It also provides mitigation for impacts to special-status species and their associated habitats.

Through agreements with the USFWS and California Department of Fish and Wildlife (CDFWG), 146 listed and special-status plant and animal species receive some level of coverage under the Western Riverside County MSHCP. Of the 146 covered species, the majority have no additional survey needs or conservation requirements. Furthermore, the Western Riverside County MSHCP provides mitigation for project-specific impacts to these species, thereby reducing the degree of impact to below a level of significance, pursuant to the California Environmental Quality Act (CEQA).

Several of the species covered under the Western Riverside County MSHCP have additional survey requirements. These include the riparian communities and associated species addressed in Section 6.1.2 of the Western Riverside County MSHCP document ("Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools"), plants identified in Section 6.1.3 ("Narrow Endemic Plant Species"); and plants and animal species addressed in Section 6.3.2 ("Additional Survey Needs and Procedures").

2.1.2 Project Relationship to the Western Riverside County MSHCP

The project area is located within the Western Riverside County MSHCP boundaries. The City of San Jacinto, acting as the lead agency for the proposed project, is a permittee under the Western Riverside County MSHCP and, therefore, is afforded coverage under the state or federal ESAs for impacts to listed species covered by the plan. The City is required to document consistency with the Western Riverside County MSHCP in conjunction with any discretionary approvals for the project. As such, this report was prepared to provide all necessary information required to determine project consistency with the Western Riverside County MSHCP.

The project area is located within the San Jacinto Valley Area Plan of the Western Riverside County MSHCP. The project site is not located within a MSHCP Criteria Cell or Cell Group. In addition, the site is not located within plan-defined areas requiring surveys for criteria area species, amphibian species, narrow endemic plants, or mammalian species. Further, the project area does not contain any habitat that would be considered riparian/riverine areas as defined in Section 6.1.2 of the Western Riverside MSHCP, and no vernal pools were observed within the

project boundaries. However, the site is located within plan-defined areas requiring surveys for burrowing owl (*Athene cunicularia*).

A habitat assessment was conducted for burrowing owl following Step 1 of the Burrowing Owl Survey Instructions for the Western Riverside MSHCP. The habitat assessment determined that the site does provide suitable burrows/nesting opportunities for burrowing owl. Focused protocol surveys following the *Burrowing Owl Survey Instructions for the Western Riverside County Multiple Species Habitat Conservation Plan Area* were conducted from May 12 to June 29, 2022. The surveys determined BUOW is absent from the project site and 500-foot buffer (Refer to Appendix E).

2.2 Field Survey

On May 12, 2023, HES conducted a field survey of the site. Ambient temperature at 6:00 A.M. was 50 degrees Fahrenheit, cloudy skies, with winds ranging from 0 to 1 mile per hour to the south. The purpose of the field survey was to document the existing habitat conditions, obtain plant and animal species information, view the surrounding land uses, assess the potential for state and federal waters, assess the potential for wildlife movement corridors, and assess the presence of constituent elements for critical habitat if present.

Linear transects were walked across the project site for 100 percent coverage. All species observed were recorded. Global Positioning System (GPS) waypoints were taken to delineate specific habitat types, species locations, state or federal waters, and any other information that would be useful for the assessment of the project site. A comprehensive list of all plant and wildlife species that were detected during the field survey within the project site is included in Appendix A, *Species List*. Sensitive plant and wildlife species with the potential to occur within the project area are listed in Appendix B, *Species Probability List*. Representative site photographs were taken and are included within Appendix C, *Site Photographs*.

3.0 Existing Conditions and Results

3.1 Environmental Setting

The 37.87-acre project site is located southwest of North Ramona Boulevard, East of North Sanderson Avenue and northwest of Ranch View Lane in the City of San Jacinto, County of Riverside, California. The site consists of residential developments to the north and east, and vacant land to the west and south. The property is relatively flat with elevations ranging from 1,469 feet to 1,482 feet above mean sea level (AMSL).

3.2 Soils

Three soil classes are identified to occur on the project site by the USDA Web Soil Survey (Appendix D, *Soils Map*). Soils at the project site are classified as follows:

- Dello loamy fine sand (DrA), 0 to 2 percent slopes, gravelly substratum ;
- Grangeville sandy loam (GpB), 0 to 5 percent slopes, drained, saline-alkali;
- Grangeville sandy loam (GsB), 0 to 5 percent slopes, poorly drained, saline-alk ali,
- Grangeville fine sandy loam (GvB), 0 to 5 percent slopes, saline-alkali, and
- Water (W)

3.3 Plant and Habitat Communities

The 5.76-acre project site consists of two habitat types: ruderal habitat and disturbed/developed habitat (Figure 4, *Habitat Map*). Following is a description of the habitat types:

Ruderal

The project site contains approximately 31.42 acres of ruderal habitat. Dominant species observed are non-native vegetation such as tumbleweed (*Salsola tragus*), prickly lettuce (*Lactuca serriola*), and stinknet (*Oncosiphon piluliferum*).

Disturbed/Developed

The project site contains approximately 6.45 acres of disturbed/developed habitat mostly devoid of vegetation. Dominant species mainly observed along edges of disturbed areas are non-native vegetation such as tumbleweed (*Salsola tragus*), prickly lettuce (*Lactuca serriola*), and red brome (*Bromus madritensis*).

3.4 Wildlife

General wildlife species documented on the project site or within the vicinity of the site includes the house finch (*Haemorhous mexicanus*) and lesser goldfinch (*Spinus psaltria*).

3.5 Regional Connectivity/Wildlife Movement

Wildlife movement corridors link together areas of suitable habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbances. The project area was evaluated for its function as a wildlife corridor that species use to move between wildlife habitat zones. Usually, mountain canyons or riparian corridors are used by wildlife as corridors.

The project area was evaluated for its function as a wildlife corridor that species use to move between wildlife habitat zones. The project site consists of flat ruderal or disturbed land surrounded by storage facilities, commercial development, and busy roads. No wildlife movement corridors were found to be present on the project site.

3.6 Sensitive Biological Resources

According to the CNDDB, a total of 52 sensitive species of plants and 60 sensitive species of animals has the potential to occur on or within the vicinity of the project area. These include those species listed or candidates for listing by the U. S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW) and California Native Plant Society (CNPS). All habitats with the potential to be used by sensitive species were evaluated during the site visit and a determination has been made for the presence or probability of presence within this report. This section will address those species listed as Candidate, Rare, Threatened, or Endangered under the state and federal endangered species laws or directed to be evaluated under the Western Riverside Multiple Species Habitat Conservation Plan (MSHCP). Sensitive species which have a potential to occur will also be discussed in this section. Other special status species are addressed within Appendix B, *Species Probability List*.

3.6.1 Sensitive Plant Resources

A total of sixteen plant species are listed as state and/or federal Threatened, Endangered, or Candidate species; are 1B.1 listed plants on the CNPS Rare Plan Inventory; or have been found to have a potential to exist on the project site. Below are descriptions of these species:

Chaparral sand-verbena
Chaparral sand-verbena (*Abronia villosa var. aurita*) is ranked 1B.1 in the CNPS Rare Plant Inventory. It is found in sandy areas of chaparral, coastal scrub, and desert dunes habitats. No habitat for this species is present on the project site. **This species is not present.**

Munz's onion
Munz's onion (*Allium munzii*) is a federally Endangered, state Threatened, and CNPS 1B.1 listed plant species. It is found in chaparral, coastal scrub, valley and foothill grasslands, cismontane woodland, and pinyon and juniper woodland. The project site does not have suitable habitat for this species. **This species is not present.**

Horn's Milk-Vetch
Horn's milk-vetch (*Astragalus hornii var. hornii*) is ranked 1B.1 in the CNPS Rare Plant Inventory. It is typically found in alkali playa, meadow, seep, and wetland habitats. No habitat for this species is present on the project site. **This species is not present.**

Coachella Valley milk-vetch
Coachella Velley milk-vetch (*Astragalus lentiginosus var. coachellae*) is a federally listed Endangered species and is ranked 1B.2 in the CNPS Rare Plant Inventory. It is typically found in sandy flats, washes, outwash fans, and on dunes. Its habitat includes desert dunes and Sonoran

Desert scrub. No habitat for this species is present on the project site. **This species is not present.**

Jaeger's milk-vetch

Jaeger's milk-vetch (*Astragalus pachypus var. jaegeri*) is ranked 1B.1 in the CNPS Rare Plant Inventory. It is often found in dry ridges and valleys and open sandy slopes. Its habitat includes coastal scrub, chaparral, valley and foothill grassland, and cismontane woodland. No habitat for this species is present on the project site. **This species is not present.**

San Jacinto Valley crownscale

San Jacinto Valley crownscale (*Atriplex coronata var. notatior*) is a federally listed Endangered species and is ranked 1B.1 in the CNPS rare plant inventory. Its habitat includes playas, valley and foothill grassland, and vernal pools. It is commonly found in the alkaline areas in the San Jacinto River Valley. No habitat for this species is present on the project site. **This species is not present.**

Parish's brittlescale

Parish's brittlescale (*Atriplex parishii*) is ranked 1B.1 in the CNPS Rare Plant Inventory. Its habitat includes shadescale scrub, alkali sink, riparian, playas, vernal pools, and wetland. It is usually found on drying alkali flats with fine soils. No habitat for this species is present on the project site. **This species is not present.**

Thread-leaved brodiaea

The thread-leaved brodiaea (*Brodiaea filifolia*) is a federally Threatened and state Endangered Species and is ranked 1B.1 in the CNPS Rare Plant Inventory. It is found in chaparral, cismontane woodlands, coastal sage scrub, valley and foothill grasslands, vernal pools and wetland. No habitat for this species is present on the project site. **This species is not present.**

Smooth tarplant

Smooth tarplant (*Centromadia pungens ssp. laevis*) is ranked 1B.1 in the CNPS Rare Plant Inventory. The species occurs in habitats that include alkali playa, chenopod scrub, meadows and seeps, riparian woodlands, wetlands, and valley and foothill grasslands. Alkaline soils are present onsite which could provide suitable habitat for this species however, the site is continually tilled for agriculture and weed abatement purposes. **This species is not present.**

Parry's spineflower

Parry's spineflower (*Chorizanthe parryi var. parryi*) is ranked 1B.1 in the CNPS Rare Plant Inventory. The species occurs in dry, sandy soils on dry slopes and flats, sometimes at the interface of two vegetations types, such as chaparral and oak woodland. Its habitat includes

coastal scrub, chaparral, cismontane woodland, valley and foothill grassland. No habitat for this species is present on the project site. **This species is not present.**

Mojave tarplant

Mojave tarplant (*Deinandra mohavensis*) is a state listed Endangered Species and is ranked 1B.3 in the CNPS Rare Plant Inventory. This species is typically found in low sand bars in riverbeds and most commonly in riparian or ephemeral grassy areas. Its habitat includes chaparral, coastal scrub, and riparian scrub. No habitat for this species is present on the project site. **This species is not present.**

Slender-horned spineflower

Slender - horned spineflower (*Dodecahema leptoceras*) is a federally and state listed Endangered Species and is ranked 1B.1 in the CNPS Rare Plant Inventory. Its habitat includes chaparral, cismontane woodland, and coastal scrub (alluvial fan sage scrub). No habitat for this species exists on the project site. **This species is not present.**

Mesa horkelia

Mesa horkelia (*Horkelia cuneate var. puberula*) is ranked 1B.1 in the CNPS Rare Plant Inventory. It is typically found in sandy or gravelly sites. Its habitat includes chaparral, cismontane woodland, and coastal scrub. No habitat for this species is present on the project site. **This species is not present.**

Coulter's goldfields

Coulter's goldfields (*Lasthenia glabrata ssp.coulteri*) is ranked 1B.1 in the CNPS Rare Plant Inventory. This species is usually found on alkaline soils in playas, sinks, and grasslands and flowers during April through May. Its habitat includes alkali playas, marsh, swamp, salt marsh, vernal pool, and wetland. No habitat for this species is present on the project site. **This species is not present.**

Spreading navarretia

Spreading navarretia (*Navarretia fossalis*) is a federally listed Threatened Species and is ranked 1B.1 in the CNPS Rare Plant Inventory. Its habitat includes alkali playa, chenopod scrub, marsh and swamp, vernal pools, and wetlands. This species is typically found in swales and vernal pools, often surrounded by other habitat types. No habitat for this species is present on the project site. **This species is not present.**

California Orcutt grass

California Orcutt grass (*Orcuttia californica*) is a federally and state listed Endangered Species and is ranked 1B.1 in the CNPS Rare Plant Inventory. It is found in vernal pools. No habitat for this species is present on the project site. **This species is not present.**

3.6.2 Sensitive Animal Resources

A total of fourteen animal species listed as state and/or federal Threatened, Endangered, Candidate will be reviewed in this section. Sensitive species which have a potential to occur will also be discussed in this section. All sensitive species within a 5-mile radius of project area were reviewed and a complete list of those species are discussed within Appendix B, *Species Probabilty List*. Below are descriptions of these species:

Tricolored blackbird
Tricolored blackbird (*Agelaius tricolor)* is a state listed Threatened Species and listed by the CDFW as a Species of Special Concern. The species occupies freshwater marshes with canopies of willows and other riparian trees. This species requires open accessible water and suitable foraging space. There is no habitat for this species on the project site. **This species is not present.**

Arroyo Toad
Arroyo Toad (*Anaxyrus californicus*) is a federally listed Endangered species and a CDFW Species of Special Concern. The most favorable breeding habitat for this species consists of slow-moving shallow pools, nearby sandbars, and adjacent stream terraces. Its habitat includes desert wash, riparian scrub, riparian woodland, south coast flowing waters, and south coast standing waters. There is no habitat for this species on the project site. **This species is not present.**

Burrowing owl
Burrowing owl (*Athene cunicularia*) is a CDFW Species of Special Concern. This species is found in coastal prairie, coastal scrub, great basin grassland, great basin scrub, Mojave Desert scrub, Sonoran Desert scrub, and valley and foothill grassland. This species is typically found in open and dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. It is a subterranean nester and is dependent upon burrowing mammals, most notably the California ground squirrel. Suitable habitat for this species is present on the project site. Although suitable habitat occurs on the project site, this species was not observed during focused surveys (Refer to Appendix E, *Focused Burrowing Owl Survey Report*). **This species is not present.**

Crotch bumble bee
Crotch bumble bee (*Bombus crotchii*) is a state Candidate Endangered species. It's located in coastal California east to the Sierra-Cascade crest and south into Mexico. Its food plan genera include *Antirrhinum*, *Phacelia*, *Clarkia*, *Dendromecon*, *Eschscholzia*, and *Eriogonum*. There is no habitat for this species on the project site. **This species is not present.**

Vernal pool fairy shrimp

Vernal pool fairy shrimp (*Branchinecta lynchi*) is a federally listed Threatened Species. This species is found in seasonal pools of water in valley and foothill grasslands. This species typically inhabits small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools. The project site does not contain suitable habitat for this species. **This species is not present.**

Southern rubber boa

Southern-rubber boa (*Charina umbratical*) is a state listed Threatened Species. Its habitat includes meadow and seep, riparian forest, riparian woodland, upper montane coniferous forest, and wetland. This species is typically found near streams or wet meadows, and requires loose, moist soil for burrowing. It seeks cover in rotting logs, rock outcrops, and under surface litter. It is known to be found in the San Bernardino and San Jacinto mountains and has been reported to be found in other areas, but further research is required. The project site does not contain suitable habitat for this species. **This species is not present.**

Western yellow-billed cuckoo

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) is a federally listed Threatened and state listed Endangered Species. This species typically nests in riparian jungles of willows, often mixed with cottonwoods, with a lower story of blackberry, nettles, or wild grape. It is found in riparian forest habitat. The project site does not contain suitable habitat for this species. **This species is not present.**

San Bernardino kangaroo rat

San Bernardino kangaroo rat (*Dipodomys merriami parvus*) is a federally listed Endangered Species, state listed Candidate Endangered Species, and a CDFW Species of Special Concern. It is found in coastal scrub habitat. This species is found in alluvial scrub vegetation on sandy loam substrates, characteristic of alluvial fans and flood plains. It needs early to intermediate seral stages. The project site does not contain suitable habitat for this species. **This species is not present.**

Stephen's kangaroo rat

Stephens' kangaroo rat (*Dipodomys stephensi*) is a federally and state listed Threatened Species. This species is found in coastal sage scrub with sparse vegetation cover, and in valley and foothill grasslands. This species prefers buckwheat, chamise, brome grass, and filaree and will burrow into firm soil. The project site does not have suitable habitat for this species. **This species is not present.**

Southwestern willow flycatcher

Southwestern willow flycatcher (*Empidonax traillii extimus*) is a federally and state listed Endangered Species. It is found in riparian woodland habitat in southern California. The project site does not contain suitable habitat for this species. **This species is not present.**

Quino checkerspot butterfly
Quino checkerspot butterfly (*Euphydryas editha quino*) is a federally listed Endangered Species. It is found in chaparral and coastal sage scrub. This species requires high densities of food plants, including *Plantago erecta*, *P. insularis*, and *Orthocarpus purpurescens*. The project site does not have suitable habitat for this species. **This species is not present.**

Coastal California gnatcatcher
Coastal California gnatcatcher (*Polioptila californica californica*) is a federally listed Threatened Species and CDFW Species of Special Concern. This species is found in coastal bluff scrub and coastal scrub habitat. This species is typically found in low, coastal sage scrub in arid washes, on mesas and slopes. The project site does not have suitable habitat for this species. **This species is not present.**

Southern mountain yellow-legged frog
Southern mountain yellow-legged frog (*Rana muscosa*) is a federally and state listed Endangered species. It is found in aquatic habitat. This species is always encountered within a few feet of water. Tadpoles may require two to four years to complete their aquatic development. The project site does not contain suitable habitat for this species. **This species is not present.**

Riverside fairy shrimp
Riverside fairy shrimp (*Streptocephalus woottoni*) is a federally listed Endangered Species. This species is found in coastal scrub, valley and foothill grassland, vernal pool, and wetland habitat. This species typically inhabits seasonally astatic pools filled by winter/spring rains. The project site does not contain suitable habitat for this species. **This species is not present.**

Least Bell's vireo
Least Bell's vireo (*Vireo bellii pusillus)* is a federal and state listed Endangered Species. This species is found in riparian forest, riparian scrub, and riparian woodland. Nesting habitat of this species is restricted to willow and/or mulefat dominated riparian scrub along permanent or nearly permanent streams. The project site does not contain suitable habitat for this species. **This species is not present.**

3.6.3 Nesting Birds

Migratory non-game native bird species are protected under the federal Migratory Bird Treaty Act. Additionally, Sections 3503, 3503.5, and 3513 of the California Fish and Game Code

prohibit take of all birds and their active nests. The project site contains shrubs that can support nesting songbirds during the nesting bird season of February 1 through September 15.

3.7 Jurisdictional Waters

No streams, drainages, or riparian habitat occur on site. No CDFW, United States Army Corps of Engineers (USACE), or Regional Water Quality Control Board (RWQCB) jurisdictional waters occur on site. Further, no wetlands or vernal pools were found on site.

4.0 Project Impacts

4.1 Impacts to Habitats

The proposed project is expected to impact the entire 37.87-acre project site consisting of ruderal habitat and additional 1.59 acres of disturbed habitat for road improvements. The proposed project will impact a total of 39.46 acres including 31.42 acres of ruderal habitat and 8.04 acres of disturbed/developed habitat.

4.2 Impacts to Sensitive Species

The following sensitive species have a potential to occur within project boundaries and may be impacted by project development:

Burrowing owl

Burrowing owl is a CDFW Species of Special Concern. A habitat assessment conducted on the site determined that suitable habitat is present due to the nature of the habitat and soil type. In addition, the project area is within a burrowing owl survey area. Focused burrowing owl protocol surveys were performed, and no burrowing owl or burrowing owl sign was found. Implementation of the steps outlined in the recommendation section (Section 6) of this report will ensure the project will not result in impacts to this species.

4.3 Impacts to Nesting Birds

Shrubs and trees on the project site contain potential nesting opportunities in ornamental trees during the nesting bird season of February 1 through September 15. Implementation of the measures identified in the Recommendations section of this report (Section 6) will ensure that potential impacts to nesting birds are less than significant.

4.4 Impacts to Critical Habitat

The project is not located within designated federal critical habitat. No impact to critical habitat is expected to occur.

4.5 Impacts to Wildlife Movement Corridors

Wildlife movement corridors link together areas of suitable habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbances. The project site was evaluated for its function as a wildlife corridor that species would use to move between wildlife habitat zones. Typically, mountain canyons or riparian corridors are used by wildlife as corridors; the project site does not contain these features. The project site consists of flat ruderal or disturbed land surrounded by residential development and vacant land. No wildlife movement corridors were found to be present on the project site. No impacts to wildlife movement corridors are expected.

4.6 Conflict with Local Policies or Ordinances Protecting Biological Resources

The development of the project site would not conflict with local policies or ordinances protecting biological resources.

4.7 Conflict with the Provisions of an Adopted Habitat Conservation Plan, Natural Community Conservation Plan, or Other Approved Local, Regional, or State Habitat Conservation Plan

The project is within the Western Riverside MSHCP. If Western Riverside MSHCP guidelines and requirements are followed, no conflicts are expected.

4.8 State and Federal Drainages

No jurisdictional waters or associated habitat occur on site. Therefore, no impacts to state or federal jurisdictional drainages will result from project implementation.

5.0 Western Riverside County MSHCP Consistency Analysis

5.1 MSHCP Requirements

The project area is located within the San Jacinto Valley Area Plan of the Western Riverside County MSHCP. The project site is not located within a MSHCP Criteria Cell or Cell Group. A discussion of the applicable Western Riverside County MSHCP requirements follows:

Section 6.1.2 Species Associated with Riparian/Riverine Habitat and Vernal Pools

The project site does not contain streams or habitat that may be considered riparian/riverine areas as defined in Section 6.1.2 of the Western Riverside County MSHCP. Due to the lack of suitable riparian habitat on the project site, focused surveys for riparian/riverine bird species listed in Section 6.1.2 of the MSHCP are not warranted.

Vernal pools are seasonal depressional wetlands that occur under Mediterranean climate conditions of the west coast and in glaciated conditions of northeastern and midwestern states.

They are covered by shallow water for variable periods from winter to spring but may be completely dry most of the summer and fall. Vernal pools are usually associated with hard clay layers or bedrock, which helps keep water in the pools. Vernal pools and seasonal depressions usually are dominated by hydrophytic plans, hydric soils, and evidence of hydrology.

The entire site was evaluated for the presence of habitat capable of supporting branchiopods. The site was evaluated as described in the USFWS Survey Guidelines for the Listed Large Branchiopods (May 31, 2016). The project area is primarily comprised of sandy loam. The onsite soils do not allow for water pooling on the site for any significant length of time after rain events. No vernal pools, swales, or vernal pool mimics such as ditches, borrow pits, cattle troughs, or cement culverts with signs of pooling water were found on the site. In addition, the site does not contain areas that showed signs of ponding water, hydrophytic vegetation, or soils typical of vernal pools that would be suitable for large branchiopods.

Section 6.1.3 Sensitive Plant Species

The project site is not located within the Western Riverside County MSHCP Narrow Endemic Plant Species Survey Area (NEPSSA) pursuant to Section 6.1.3 of the MSHCP. Therefore, the NEPSSA requirements are not applicable to the project.

Section 6.1.4 Urban/Wildlands Interface Guidelines

The project site is not located within or adjacent to a Western Riverside County MSHCP Conservation Area; therefore, the project site is not required to address Section 6.1.4 of the Western Riverside County MSHCP.

Section 6.3.2 Additional Surveys and Procedures

The project site is not located within the Western Riverside County MSHCP Additional survey areas for amphibians, mammals, or any special linkage areas. In addition, the project site is not located within the Western Riverside County MSHCP Criteria Area Plant Species Survey Area (CAPSSA) pursuant to Section 6.3.2 of the Western Riverside County MSHCP. However, the project site is located within the Western Riverside County MSHCP Additional survey area for burrowing owl.

The habitat assessment conducted on the site found that the project site does provide suitable burrows/nesting opportunities for burrowing owl and the closest CNDDB occurrence was less than a mile away. Therefore, focused surveys for this species were conducted on the project site in May and June of 2023 (Appendix E). Well-drained soils, ground squirrels and potential burrows were observed on the site. Approximately 29 suitable burrows were identified and recorded on site and within the 150-meter buffer. However, burrowing owl signs such as molted feathers, pellets, prey remains, or whitewash were not found. Further, no burrowing owl were observed on the project site. Based on the absence of burrowing owl and burrowing owl

evidence within the study area, it can be concluded that the study area is not currently in use by burrowing owl.

However, the project site is located within the Western Riverside County MSHCP burrowing owl survey area, a 30-day preconstruction survey is required prior to the commencement of project activities (e.g. vegetation clearing, clearing and grubbing, tree removal, site watering) to ensure that no owls have colonized the site in the days or weeks preceding project activities. If BUOW are found to have colonized the project site prior to the initiation of construction, the project proponent will immediately inform RCA and the Wildlife Agencies and will need to prepare a Burrowing Owl Protection and Relocation Plan for approval by RCA and the Wildlife Agencies prior to initiating ground disturbance. If ground-disturbing activities occur but the site is left undisturbed for more than 30 days, a pre-construction survey will again be necessary to ensure burrowing owl has not colonized the site since it was last disturbed. If burrow owl is found, the same coordination described above will be necessary

6.0 Recommendations

Implementation of the following measures will mitigate any potential impacts resulting from project activities.

Burrowing Owl

- The project site is located within the Western Riverside County MSHCP burrowing owl survey area, a 30-day preconstruction survey is required prior to the commencement of project activities (e.g. vegetation clearing, clearing and grubbing, tree removal, site watering) to ensure that no owls have colonized the site in the days or weeks preceding project activities.

- If BUOW are found to have colonized the project site prior to the initiation of construction, the project proponent will immediately inform RCA and the Wildlife Agencies and will need to prepare a Burrowing Owl Protection and Relocation Plan for approval by RCA and the Wildlife Agencies prior to initiating ground disturbance.

- If ground-disturbing activities occur but the site is left undisturbed for more than 30 days, a pre-construction survey will again be necessary to ensure burrowing owl has not colonized the site since it was last disturbed. If burrow owl is found, the same coordination described above will be necessary.

Nesting Birds

- It is recommended that vegetation removal be conducted during the non-nesting season for migratory birds to avoid direct impacts. The non-nesting season is between February 1 and September 15.

- If vegetation removal will occur during the migratory bird nesting season, between February 1 and September 15, it is recommended that pre-construction nesting bird surveys be performed within three days prior to vegetation removal.

- If active nests are found during nesting bird surveys, they shall be flagged, and a 200-foot buffer shall be fenced around the nests.

- A biological monitor shall visit the site once a week during ground disturbing activities to ensure all fencing is in place and no sensitive species are being impacted.

7.0 Certification

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.



Date 08-04-2023 Signed _____

PROJECT MANAGER

Fieldwork Performed By:

Elizabeth Gonzalez

_____

SENIOR BIOLOGIST

Sarah Vasquez

_____

ASSOCIATE BIOLOGIST

8.0 References

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Western Riverside County Multiple Species Habitat Conservation Plan. Burrowing *Owl Instructions for Western Riverside Multiple Species Habitat Conservation Plan.*

Western Riverside County Multiple Species Habitat Conservation Plan. Section *6.0 MSHCP Implementing Structure.*

FIGURE 1

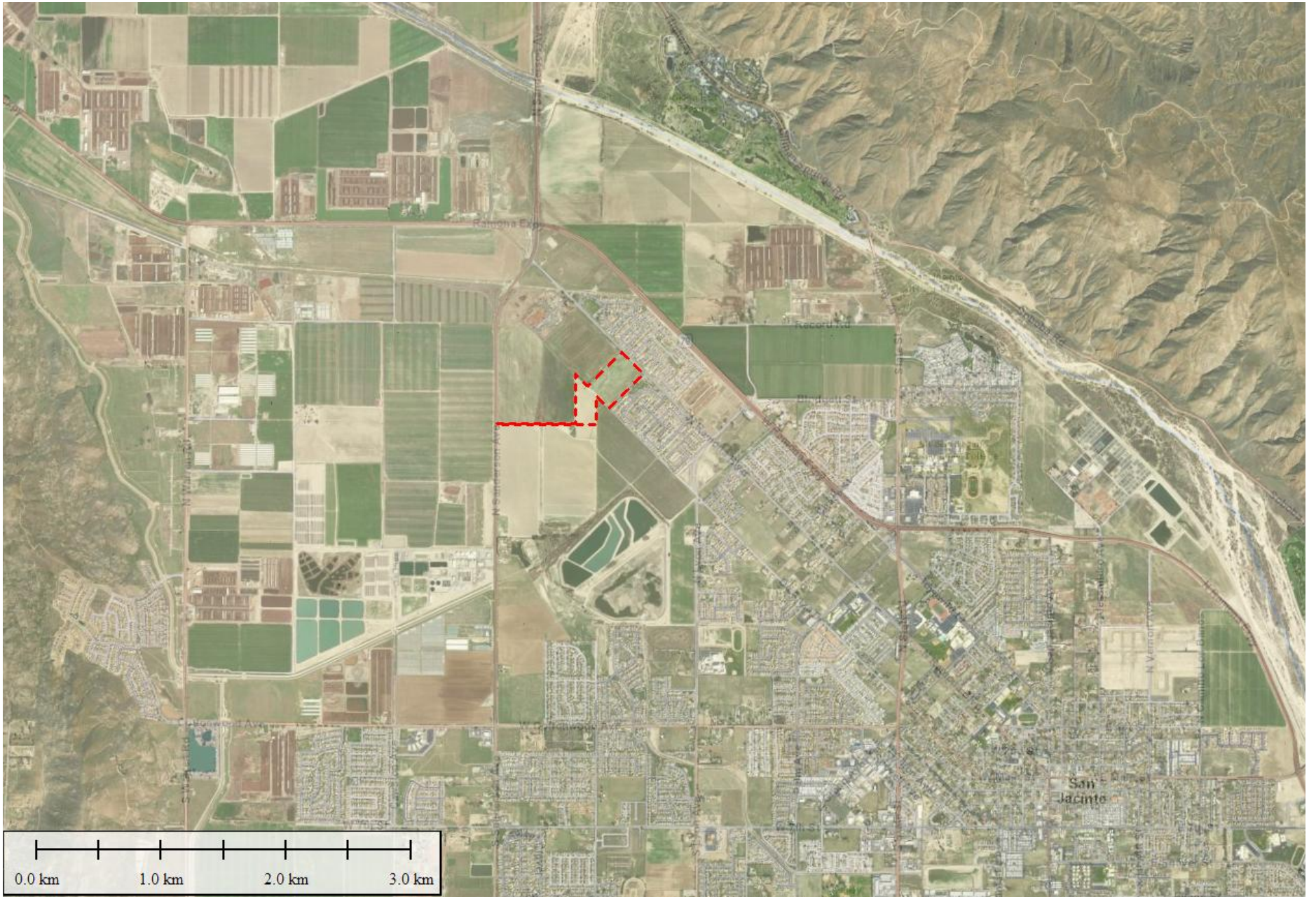


Figure 1
Location Map
TTM 38066
San Jacinto
Riverside County, California

Legend

Project Site

N

Hernandez Environmental Services

FIGURE 2

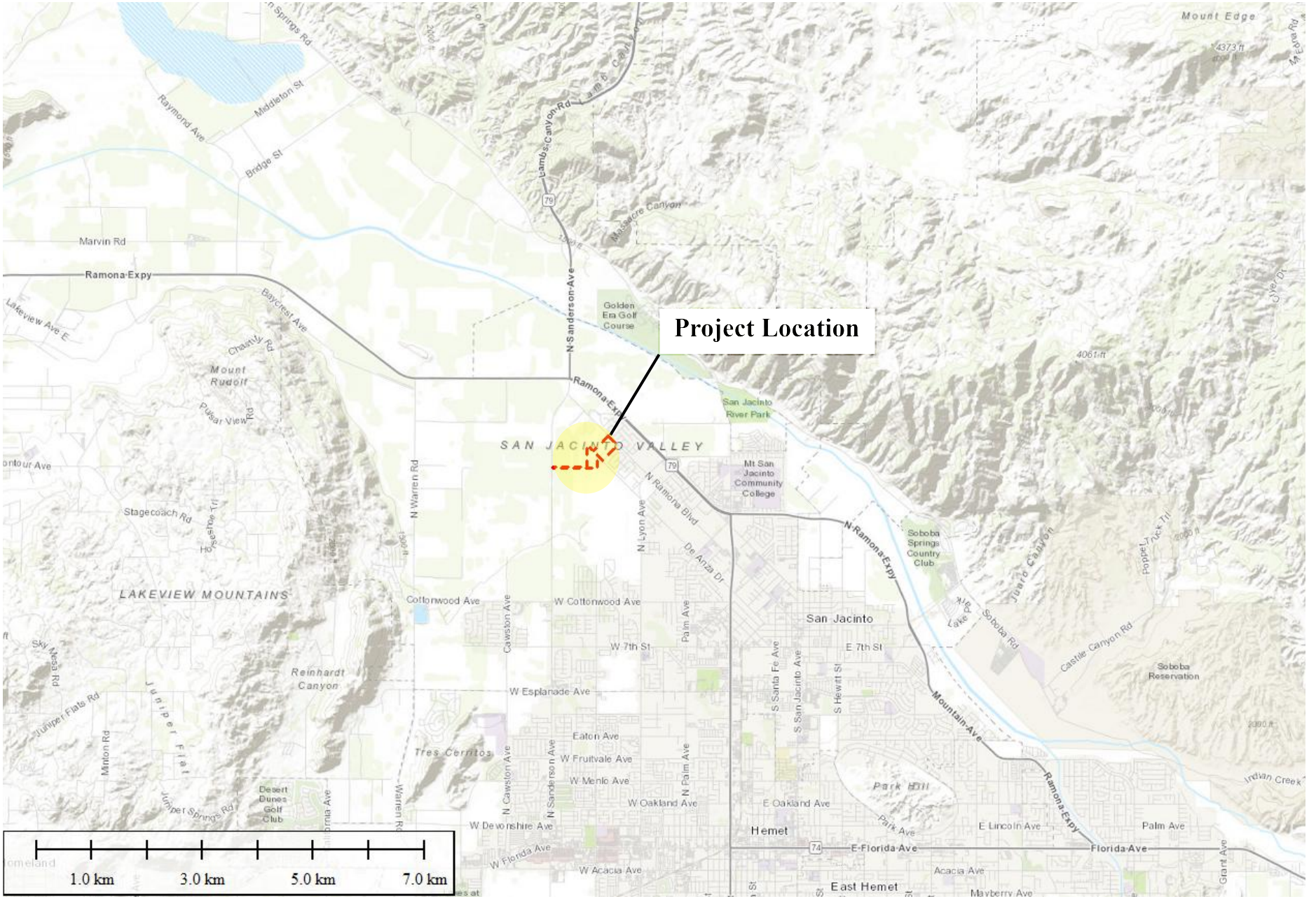


Figure 2
Vicinity Map
TTM 38066
San Jacinto
Riverside County, California

Legend

Project Site

N

Hernandez Environmental Services

FIGURE 3

CITY OF SAN JACINTO
TENTATIVE TRACT MAP 38066

SHEET INDEX

TENTATIVE TRACT MAP	1 & 2
CONCEPTUAL GRADING DRAINAGE PLAN	3
CONCEPTUAL UTILITY PLAN	4
CONCEPTUAL SIGNING & STRIPING PLAN ALONG RAMONA BLVD	5
PRELIMINARY WQMP SITE PLAN	6

LEGAL DESCRIPTION:

THE LAND REFERRED TO HEREI BELOW IS SITUATED IN THE CITY OF SAN JACINTO, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL ONE:

THAT PORTION OF FARM LOT 129 OF LAND OF SAN JACINTO LAND ASSOCIATION IN THE CITY OF SAN JACINTO, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 8, PAGE 357 OF MAPS, RECORDS OF SAN DIEGO COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEASTERLY CORNER OF SAID LOT 129 WHICH CORNER IS ALSO THE NORTHEASTERLY CORNER OF FARM LOT 133 OF SAID LANDS OF SAN JACINTO LAND ASSOCIATION AS SHOWN BY MAP ON FILE IN BOOK 8, PAGE 357 OF MAPS, RECORDS OF SAN DIEGO COUNTY, CALIFORNIA; THENCE WESTERLY ALONG THE NORTHERLY LINE OF SAID LOT 133, A DISTANCE OF 561.00 FEET; THENCE NORTHERLY AND PARALLEL TO THE EASTERLY LINE OF SAID LOT 129, A DISTANCE OF 1,325.00 FEET, MORE OR LESS, TO THE NORTHEASTERLY LINE OF SAID LOT 129; THENCE SOUTHEASTERLY ALONG THE NORTHEASTERLY LINE OF SAID LOT 129, A DISTANCE OF 740.00 FEET, MORE OR LESS, TO THE MOST NORTHERLY CORNER OF FARM LOT 130 OF LANDS OF SAN JACINTO LAND ASSOCIATION AS SHOWN BY MAP ON FILE IN BOOK 8, PAGE 357 OF MAPS, RECORDS OF SAN DIEGO COUNTY CALIFORNIA; THENCE SOUTHERLY ALONG THE EASTERLY LINE OF SAID LOT 129, A DISTANCE OF 750.00 FEET, MORE OR LESS, TO THE TRUE POINT OF BEGINNING.

APN PORTION OF 439-030-001

PARCEL THREE:

THE SOUTHEASTERLY HALF OF FARM LOT 7 OF LANDS OF SAN JACINTO LAND ASSOCIATION, IN THE CITY OF SAN JACINTO, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 8, PAGE 357 OF MAPS, RECORDS OF SAN DIEGO COUNTY.
APN: 436-040-006

PARCEL FOUR:

THE NORTHWESTERLY QUARTER OF FARM LOT 9 OF LANDS OF SAN JACINTO LAND ASSOCIATION, IN THE CITY OF SAN JACINTO, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 8, PAGE 357 OF MAPS, RECORD OF OF SAN DIEGO COUNTY.
APN: 436-040-008

TITLE EXCEPTION AND EASEMENTS:

PER TITLE REPORT BY FIDELITY NATIONAL TITLE COMPANY DATED ON JANUARY 14, 2019
ORDER NUMBER: 00214622-994VNO-CH

- *AN EASEMENT IN FAVOR OF THE PUBLIC FOR ROAD PURPOSES (DE ANZA DRIVE) PER MAP OF THE "LANDS OF SAN JACINTO LAND ASSOCIATION", M.B. 8/357 SAN DIEGO COUNTY.*

(4) *RIGHTS OF THE PUBLIC IN AND TO ANY PORTION OF THE PROPERTY HEREIN DESCRIBED LYING WITHIN DE ANZA DRIVE. A PORTION OF WHICH WAS ACCEPTED IN A RESOLUTION EXECUTED BY THE BOARD OF SUPERVISORS FOR THE COUNTY OF RIVERSIDE*

RECORDING DATE: JANUARY 27, 1953
RECORDING NO,: BOOK 1435, PAGE 487, OFFICIAL RECORS

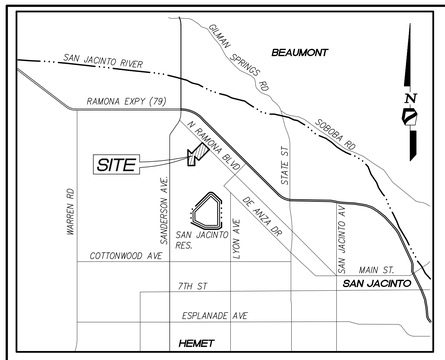
BENCHMARK:

RIVERSIDE COUNTY BENCH MARK
H-48, AUGUST 1985
ELEV. = 1464.075

0.3 MILE SE'LY ALONG RAMONA BLVD., FROM THE INTERSECTION OF SANDERSON AVE AND RAMONA BLVD., 1 FT. ± N'LY OF THE S'LY END OF A 5FT LONG X 2 FT HIGH CONCRETE HEADWALL; 44 FT ± ELY OF THE NE'LY CORNER OF A CONCRETE DRIVEWAY AT 37835 RAMONA BLVD., SET A STD. 3" DIA. ALUM. DISK, STAMPED AS ABOVE, IN THE TOP OF HEADWALL.

FLOODZONE:

ACCORDING TO THE COUNTY OF MORENO VALLEY BLVD AND BASED UPON THE NATIONAL INSURANCE PROGRAM MAPS THIS SITE LIES WITHIN FLOOD ZONE A SHADED, COMMUNITY PANEL NO. 06065C1490H DATED APRIL 19, 2017 AND 06065C1470H, AUGUST 28, 2008 AND 06065C1480H, AUGUST 287, 2008 PUBLISHED BY THE FEDERAL INSURANCE ADMINISTRATION.



VICINITY MAP
N.T.S.



GENERAL NOTES:

PROJECT LOCATION:	SW SIDE OF RAMONA BLVD BETWEEN SHIMMERING WAY AND RANCH VIEW LANE, SAN JACINTO, CA 92582
ASSESSOR PARCEL NUMBER:	436-030-001, 436-040-006 & 436-040-008
EXISTING AND PROPOSED ZONING DESIGNATION:	RM / RL
PLAN DESIGNATION:	RM / RL
SUBDIVISION ACREAGE:	37.87 ACRE
DATE MAP PREPARED:	OCTOBER, 2022
NUMBERED LOTS / DWELLING UNITS:	184 LOTS
MIN, LOT SIZE:	4,800 SF
NUMBER OF OPEN SPACE LOTS:	3 LOTS

LEGEND:

- PROJECT BOUNDARY LINE
- LOT LINE
- CENTER LINE
- R/W
- EASEMENTS
- STORM DRAIN
- -S- SEWER LINE
- -W- WATER LINE
- RETAINING WALL

PHASE #	TOTAL
1	35 LOTS
2	70 LOTS
3	53 LOTS
4	48 LOTS
TOTAL	206 LOTS

UTILITY PURVEYORS

WATER & SEWER:
EASTERN MUNICIPAL WATER DISTRICT
2270 TRUMBLE ROAD, PERRIS, CALIFORNIA 92572
PH: (951) 928-3777

ALEX SALAZAR
PH: (909)335-7602
ASALAZAR@SOCALGAS.COM

CABLE / CHARTER:
JOSH VOLLMER
PH: (858) 652-8236
JOSHUA.VOLLMER@CHARTER.COM

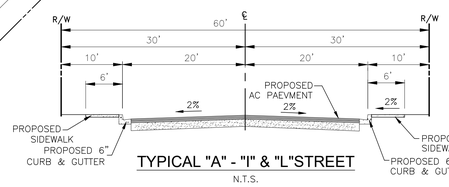
TELEPHONE/FRONTIER
REBECCA SMITH
PH: (909) 748-6643
REBECCA.SMITH1@FTR.COM

SCE
LETICIA MENDOZA
PH: (951) 212-2366
LETICIA.MENDOZA@SCE.COM

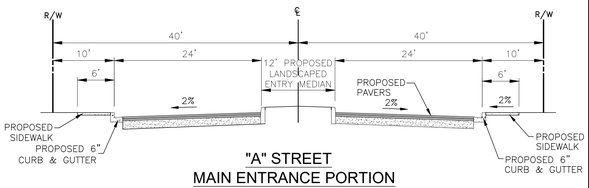
SCHOOL DISTRICT:
SAN JACINTO UNIFIED SCHOOL DISTRICT
20455 SOUTH SAN JACINTO AVENUE
SAN JACINTO, CA 92583
PH: (800) 892-2253

OWNER/DEVELOPER:

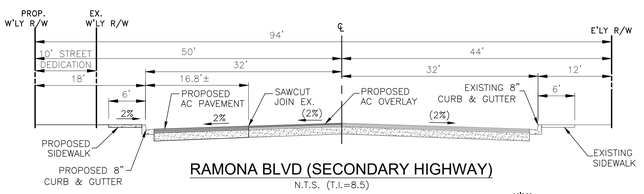
CAMELLIA HOMES
8201 GRAND DRIVE
HUNTINGTON BEACH, CA 92646
PHONE: (858) 997-7973



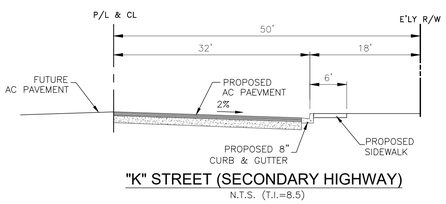
TYPICAL "A" - "I" & "L"STREET
N.T.S.



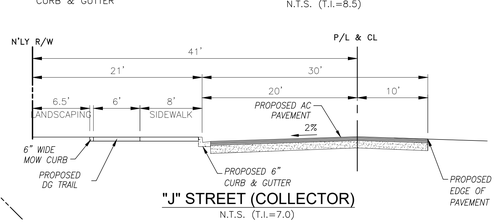
"A" STREET
MAIN ENTRANCE PORTION
N.T.S.



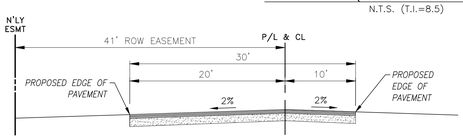
RAMONA BLVD (SECONDARY HIGHWAY)
N.T.S. (T.I.=8.5)



"K" STREET (SECONDARY HIGHWAY)
N.T.S. (T.I.=8.5)



"J" STREET (COLLECTOR)
N.T.S. (T.I.=7.0)



"J" STREET TO SANDERSON AVE
N.T.S.

MATCH LINE - SEE SHEET 2

REVISION			
DESCRIPTION	REC.	APPR.	DATE

REGISTERED PROFESSIONAL ENGINEER — TIN N. HUYNH — NO. 69273 Exp. 06/30/24 — CIVIL — STATE OF CALIFORNIA

HUNSAKER & ASSOCIATES
IRVINE INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
Three Hughes Irvine, CA 92618 ▪ PH: (949) 583-1010 ▪ FX: (949) 583-0759

PREPARED UNDER THE SUPERVISION OF:

TIN N. HUYNH R.C.E. NO. 69273 DATE

CITY OF SAN JACINTO
CALIFORNIA

VALLE RESEDA
TENTATIVE TRACT MAP
N. RAMONA BLVD SAN JANCINTO, CA 92582

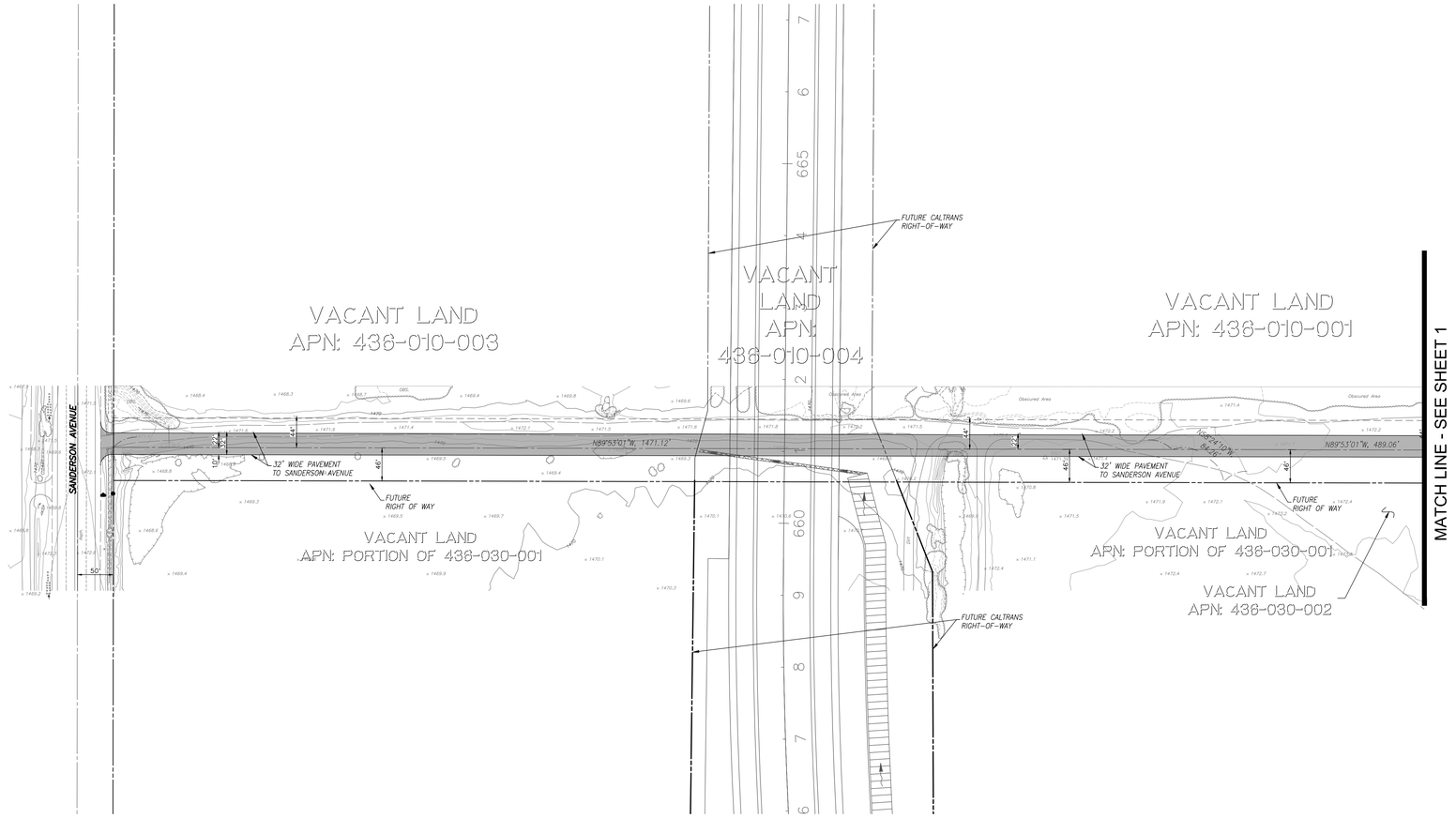
SCALE: AS SHOWN

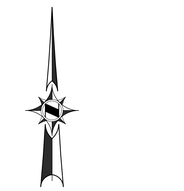
DRAWING NO. | PROJECT NO. | SHEET 1 OF 6 SHEETS

W.O. 4513-1 TRACT NO. 38066 TENTATIVE TRACT MAP

PLOTTED BY: Sophie Pham DATE: Apr. 26, 2023 11:51:53 AM FILE: F:\1244\Planning\SA_Site\Exh_TTM\SHT01.dwg

CITY OF SAN JACINTO
TENTATIVE TRACT MAP 38066



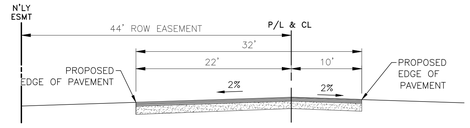


0 40 80 160 240 320

SCALE: 1" = 80'

LEGEND:

- PROJECT BOUNDARY LINE
- LOT LINE
- CENTER LINE
- R/W
- EASEMENTS
- STORM DRAIN
- SEWER LINE
- WATER LINE
- PROPSOED AC PAVEMENT



"J" STREET TO SANDERSON AVE

N.T.S.

LOT AREA TABLE

TTM TRACT 38066
LOT AREA TABLE

Lot No.	Lot Area (SF)	Lot No.	Lot Area (SF)	Lot No.	Lot Area (SF)	Lot No.	Lot Area (SF)	Lot No.	Lot Area (SF)
1	5,345	51	5,973	101	4,601	151	4,650	201	4,501
2	**5,300**	**52**	**5,504**	**102**	**4,601**	**152**	**5,488**	**202**	**4,420**
3	5,300	53	5,170	103	4,601	153	4,535	203	4,420
4	**5,300**	**54**	**5,170**	**104**	**4,601**	**154**	**4,600**	**204**	**4,420**
5	5,300	55	5,115	105	4,601	155	4,471	205	4,420
6	**5,300**	**56**	**4,607**	**106**	**4,601**	**156**	**3,916**	**206**	**4,895**
7	5,300	57	4,404	107	4,601	157	3,849	**LOT "A"**	**18,450**
8	**5,300**	**58**	**6,567**	**108**	**4,601**	**158**	**6,093**	**LOT "B"**	**99,730**
9	5,300	59	6,663	109	4,601	159	6,735	LOT "C"	15,250
10	**5,200**	**60**	**4,404**	**110**	**4,592**	**160**	**3,554**		
11	6,200	61	4,607	111	4,450	161	3,852		
12	**5,200**	**62**	**5,115**	**112**	**4,605**	**162**	**4,359**		
13	5,200	63	5,170	113	5,234	163	4,425		
14	**5,200**	**64**	**5,170**	**114**	**4,650**	**164**	**4,503**		
15	5,200	65	5,507	115	4,650	165	4,511		
16	**5,200**	**66**	**5,504**	**116**	**4,650**	**166**	**4,431**		
17	5,200	67	5,170	117	4,650	167	4,365		
18	**5,200**	**68**	**5,170**	**118**	**4,650**	**168**	**3,859**		
19	5,200	69	5,116	119	4,650	169	3,557		
20	**5,005**	**70**	**4,609**	**120**	**4,650**	**170**	**6,731**		
21	5,406	71	4,402	121	4,650	171	6,742		
22	**7,558**	**72**	**6,661**	**122**	**4,650**	**172**	**3,556**		
23	5,001	73	7,740	123	4,650	173	3,854		
24	**5,839**	**74**	**5,412**	**124**	**4,650**	**174**	**4,361**		
25	4,601	75	5,367	125	4,650	175	4,427		
26	**4,600**	**76**	**5,369**	**126**	**4,650**	**176**	**4,507**		
27	4,600	77	5,170	127	4,650	177	4,505		
28	**4,600**	**78**	**5,170**	**128**	**4,650**	**178**	**4,425**		
29	4,600	79	5,499	129	4,650	179	4,356		
30	**4,600**	**80**	**7,039**	**130**	**4,650**	**180**	**3,847**		
31	4,600	81	7,092	131	4,650	181	3,555		
32	**4,600**	**82**	**6,930**	**132**	**5,560**	**182**	**6,545**		
33	4,599	83	5,786	133	5,550	183	6,960		
34	**4,689**	**84**	**8,197**	**134**	**4,650**	**184**	**3,561**		
35	6,535	85	7,364	135	4,650	185	3,847		
36	**6,186**	**86**	**4,953**	**136**	**4,650**	**186**	**4,358**		
37	7,419	87	5,945	137	4,650	187	4,427		
38	**6,875**	**88**	**4,600**	**138**	**4,650**	**188**	**4,507**		
39	6,251	89	4,600	139	4,650	189	4,501		
40	**5,617**	**90**	**4,600**	**140**	**4,650**	**190**	**4,419**		
41	5,520	91	4,600	141	4,650	191	4,348		
42	**5,520**	**92**	**4,600**	**142**	**4,650**	**192**	**3,835**		
43	5,520	93	4,600	143	4,650	193	3,554		
44	**5,520**	**94**	**4,600**	**144**	**4,650**	**194**	**6,761**		
45	5,520	95	4,600	145	4,650	195	6,672		
46	**5,520**	**96**	**4,600**	**146**	**4,650**	**196**	**3,570**		
47	5,520	97	4,600	147	4,650	197	3,846		
48	**5,520**	**98**	**4,600**	**148**	**4,650**	**198**	**4,360**		
49	5,520	99	4,601	149	4,650	199	4,432		
50	**5,520**	**100**	**4,601**	**150**	**4,650**	**200**	**4,511**		

REVISION

	DESCRIPTION	REC.	APPR.	DATE

REGISTERED PROFESSIONAL ENGINEER
TIN N. HUYNH
NO. 69273
Exp. 06/30/24
CIVIL
STATE OF CALIFORNIA

HUNSAKER & ASSOCIATES
IRVINE INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
Three Hughes Irvine, CA 92618 ▪ PH: (949) 583-1010 ▪ FX: (949) 583-0759

PREPARED UNDER THE SUPERVISION OF:

TIN N. HUYNH R.C.E. NO. 69273 DATE

CITY OF SAN JACINTO
CALIFORNIA

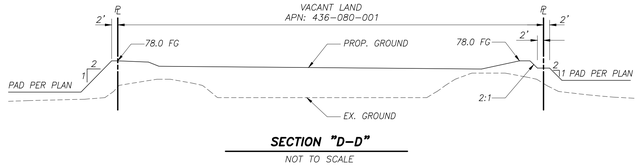
VALLE RESEDA
TENTATIVE TRACT MAP
N. RAMONA BLVD SAN JANCINTO, CA 92582

DRAWING NO. | PROJECT NO. | SCALE: AS SHOWN | SHEET 2 OF 6 SHEETS

W.O. 4513-1 TRACT NO. 38066 TENTATIVE TRACT MAP

PLOTTED BY: Sophie Pham DATE: Apr. 26, 2023 11:49:46 AM FILE: F:\1244\Planning\SA_Site\Exh_TTM\SHT02.dwg

CITY OF SAN JACINTO
CONCEPTUAL GRADING DRAINAGE PLAN



SECTION "D–D"
NOT TO SCALE

EARTHWORK QUANTITIES	
RAW CUT	70,230 CU. YDS.
RAW FILL	70,230 CU. YDS.
NET EXPORT	0 CU. YDS.

PHASE #	TOTAL
1	35 LOTS
2	70 LOTS
3	53 LOTS
4	48 LOTS
TOTAL	206 LOTS

LEGEND:

- PROJECT BOUNDARY LINE
- LOT LINE
- CENTER LINE
- R/W
- EASEMENTS
- STORM DRAIN
- -S- SEWER LINE
- -W- WATER LINE
- EDF EDGE OF DEEPENED FOOTING
- BTM BOTTOM
- C/F CUT FILL TRANSITION LINE
- PROPOSED DRAINAGE PATTERN
- EXISTING DRAINAGE PATTERN
- PROPOSED AC PAVEMENT

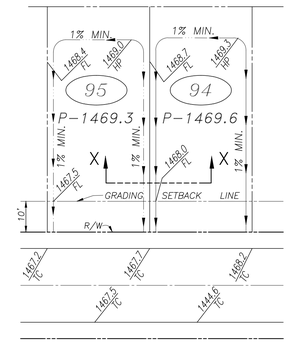
TC	TOP OF CURB
FL	FLOWLINE
BW	BACK OF WALK
HP	HIGH POINT
P	PAD ELEVATION
FF	FINISH FLOOR
FS	FINISH SURFACE
GB	GRADE BREAK
BSL	BUILDING SETBACK LINE
FG	FINISH GROUND
NG	NATURAL GROUND
TF	TOP OF BLOCK WALL FOOTING
TG	TOP OF GRATE
S	SEWER
W	WATER
INV	INVERT

TITLE EXCEPTIONS AND EASEMENTS

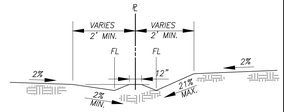
PER TITLE REPORT BY FIDELITY NATIONAL TITLE COMPANY DATED ON JANUARY 14, 2019, ORDER NUMBER: 00214622–994–VNO–CH

(4) RIGHTS OF THE PUBLIC IN AND TO ANY PORTION OF THE PROPERTY HEREIN DESCRIBED LYING WITHIN DE ANZA DRIVE. A PORTION OF WHICH WAS ACCEPTED IN A RESOLUTION EXECUTED BY THE BOARD OF SUPERVISORS FOR THE COUNTY OF RIVERSIDE

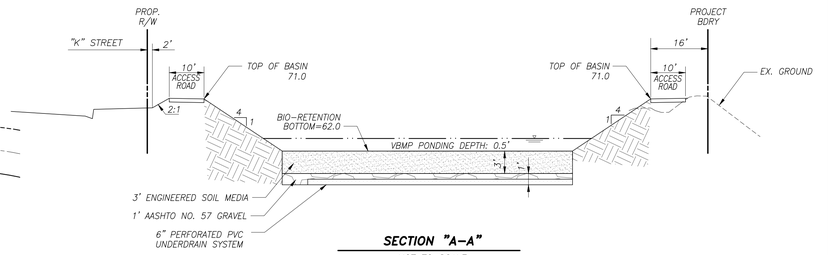
RECORDING DATE: JANUARY 27, 1953
RECORDING NO.: BOOK 1435, PAGE 487, OFFICIAL RECORDS



TYPICAL ROUGH GRADE SECTIONS
N.T.S.



SECTION "X–X"



SECTION "A–A"
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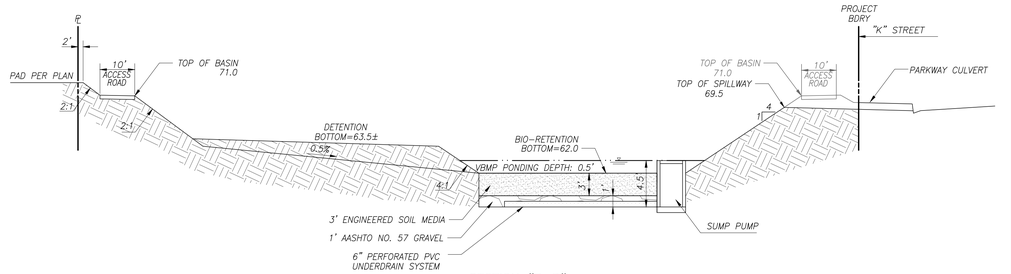

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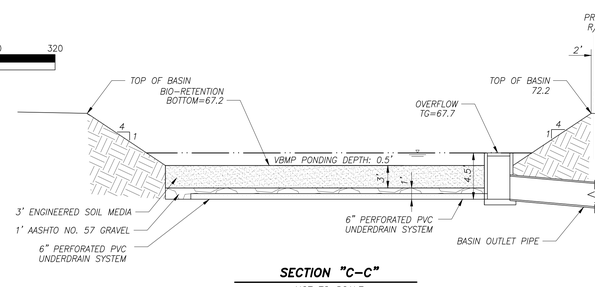

SECTION "C–C"
NOT TO SCALE

REVISION			
DESCRIPTION	REC.	APPR.	DATE

REGISTERED PROFESSIONAL ENGINEER TIN N. HUYNH NO. 69273 Exp. 06/30/24 CIVIL STATE OF CALIFORNIA

HUNSAKER & ASSOCIATES
IRVINE INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
Three Hughes Irvine, CA 92618 ▪ PH: (949) 583-1010 ▪ FX: (949) 583-0759

PREPARED UNDER THE SUPERVISION OF:

TIN N. HUYNH R.C.E. NO. 69273 DATE

CITY OF SAN JACINTO CALIFORNIA

VALLE RESEDA
CONCEPTUAL GRADING DRAINAGE PLAN
N. RAMONA BLVD SAN JANCINTO, CA 92582

SCALE: AS SHOWN

DRAWING NO. | PROJECT NO. | SHEET 3 OF 6 SHEETS

W.O. 4513-1 TRACT NO. 38066 TENTATIVE TRACT MAP

PLOTTED BY: Sophie Pham DATE: Apr. 26, 2023 11:52:15 AM FILE: F:\1244\Planning\SA_Site\Exh_TTM\SHT03.dwg

CITY OF SAN JACINTO
CONCEPTUAL UTILITY PLAN

0 40 80 160 240 320
SCALE: 1" = 80'

LEGEND:

- PROJECT BOUNDARY LINE
- LOT LINE
- CENTER LINE
- R/W
- EASEMENTS
- STORM DRAIN
- SEWER LINE
- WATER LINE
- PROPOSED SEWER LINE
- PROPOSED WATER LINE
- EXISTING FIRE HYDRANT
- WV — WATER VALVE
- PP — POWER POLE
- WM — WATER METER
- PB — PULL-BOX
- CO — SEWER CLEAN-OUT
- EXISTING STREET SIGNAL
- PARKING LIGHT
- IRR. WM — IRRIGATION WATER METER
- DDC — DOUBLE DETECTOR CHECK VAVLE
- SMH — SEWER MANHOLE
- CB — CATCH BASIN
- FDC — FIRE DETECTOR CHECK VAVLE

TITLE EXCEPTIONS AND EASEMENTS

PER TITLE REPORT BY FIDELITY NATIONAL TITLE COMPANY DATED ON JANUARY 14, 2019, ORDER NUMBER: 00214622-994-VNO-CH

(4) RIGHTS OF THE PUBLIC IN AND TO ANY PORTION OF THE PROPERTY HEREIN DESCRIBED LYING WITHIN DE ANZA DRIVE, A PORTION OF WHICH WAS ACCEPTED IN A RESOLUTION EXECUTED BY THE BOARD OF SUPERVISORS FOR THE COUNTY OF RIVERSIDE

RECORDING DATE: JANUARY 27, 1953
RECORDING NO.: BOOK 1435, PAGE 487, OFFICIAL RECORDS

UTILITY & SERVICE AGENCIES:

ELECTRIC:	SOUTHERN CALIFORNIA EDISON PH: (800) 655-4555
GAS:	THE GAS COMPANY 527 N. SAN JACINTO AVE, HEMET, CA 92583 PH: 1-800-427-2200
WATER & SEWER:	EASTERN MUNICIPAL/WATER DISTRICT 2270 TRUMBLE ROAD (951) 928-3777
CABLE/BROADBAND:	TIME WARNER PH: 1-800-892-2253
TELEPHONE/FIOS TV /BROADBAND:	VERIZON CALIFORNIA PH: 1-800-483-4000
SCHOOL DISTRICT	SAN JACINTO UNIFIED SCHOOL DISTRICT 2045 S. SAN JACINTO AVENUE, SAN JACINTO, CA 92583 PH: 1-800-892-2253

PHASE #	TOTAL
1	35 LOTS
2	70 LOTS
3	53 LOTS
4	48 LOTS
TOTAL	206 LOTS

REVISION

DESCRIPTION	REC.	APPR.	DATE

REGISTERED PROFESSIONAL ENGINEER — TIN N. HUYNH — NO. 69273 Exp. 06/30/24 — STATE OF CALIFORNIA — CIVIL

HUNSAKER & ASSOCIATES
IRVINE INC.
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PREPARED UNDER THE SUPERVISION OF:

TIN N. HUYNH R.C.E. NO. 69273 DATE

CITY OF SAN JACINTO
CALIFORNIA
VALLE RESEDA
CONCEPTUAL UTILITY PLAN
N. RAMONA BLVD SAN JANCINTO, CA 92582

DRAWING NO. | PROJECT NO. | SCALE: AS SHOWN | SHEET 4 OF 6 SHEETS

W.O. 4513-1 TRACT NO. 38066 TENTATIVE TRACT MAP

PLOTTED BY: Sophie Pham DATE: Apr. 26, 2023 11:54:04 AM FILE: F:\1244\Planning\SA_Site\Exh_TTM\SHT04.dwg

CITY OF SAN JACINTO, COUNTY OF RIVERSIDE

CONCEPTUAL SIGNING & STRIPING PLAN

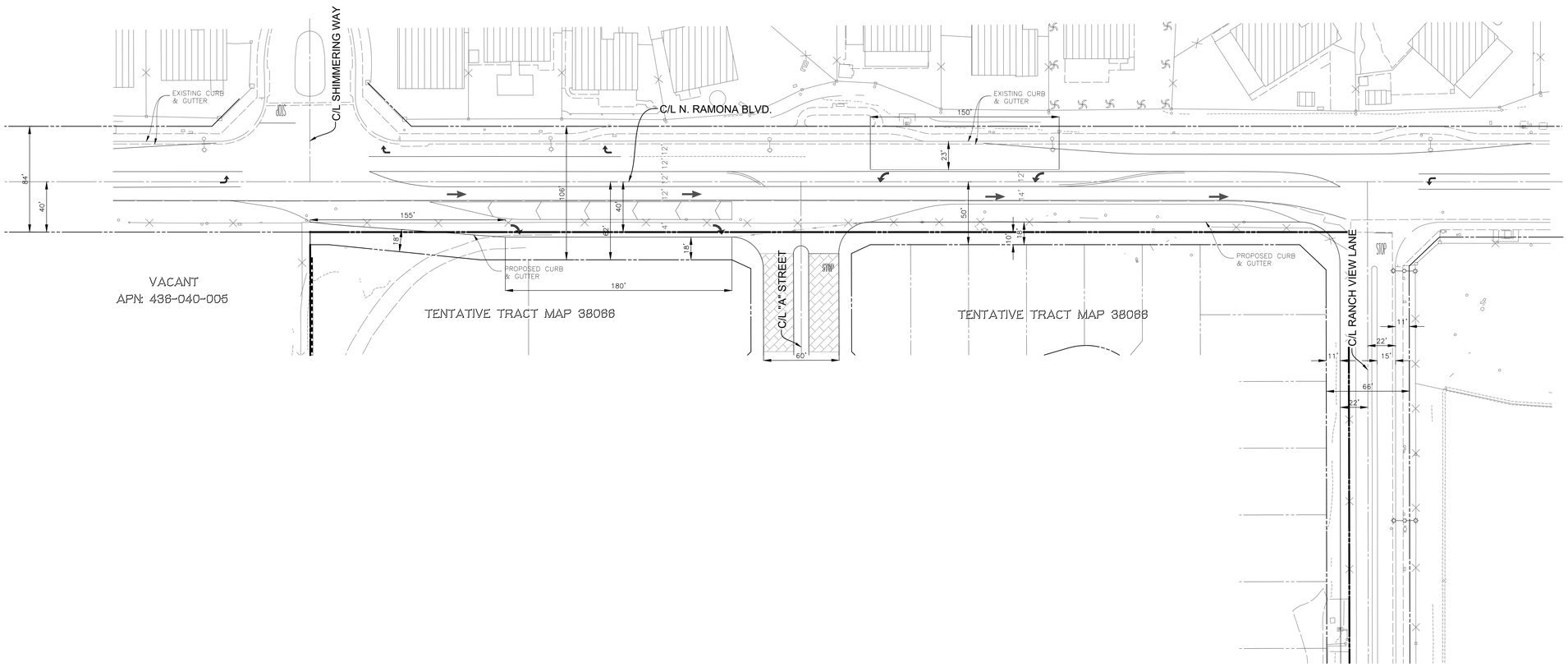
RAMONA BLVD., TTM 38066

0 20 40 80 120 160

SCALE: 1" = 40'

LEGEND:

- PROJECT BOUNDARY LINE
- LOT LINE
- CENTER LINE
- R/W
- EASEMENTS



REVISION					
			DESCRIPTION	REC.	APPR.	DATE

REGISTERED PROFESSIONAL ENGINEER TIN N. HUYNH NO. 69273 Exp. 06/30/24 CIVIL STATE OF CALIFORNIA

HUNSAKER & ASSOCIATES
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PREPARED UNDER THE SUPERVISION OF:

TIN N. HUYNH R.C.E. NO. 69273 DATE

CITY OF SAN JACINTO
CALIFORNIA

VALLE RESEDA
CONCEPTUAL SIGNING & STRIPING PLAN
N. RAMONA BLVD SAN JANCINTO, CA 92582

SCALE: AS SHOWN

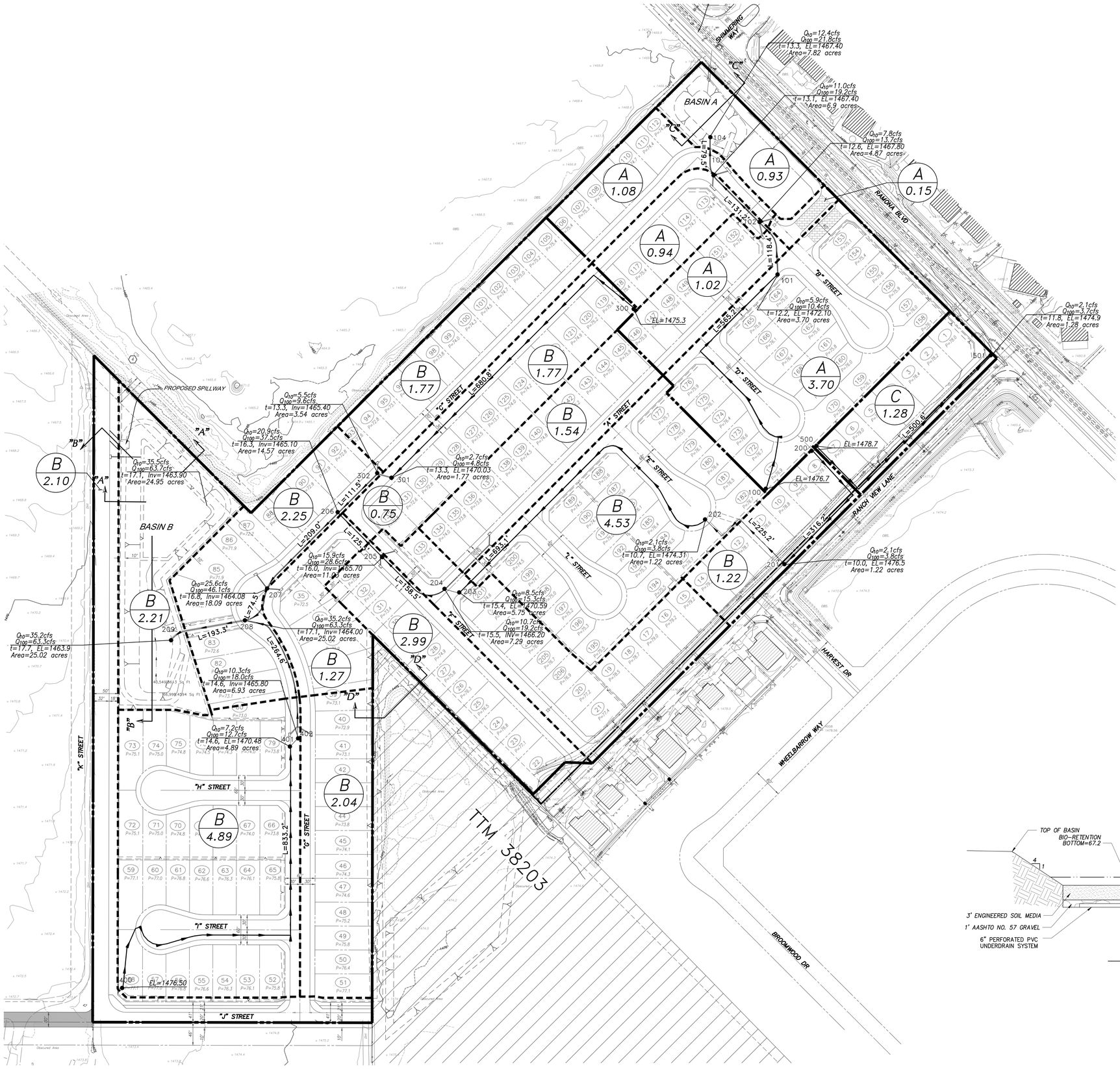
DRAWING NO. | PROJECT NO. | SHEET 5 OF 6 SHEETS

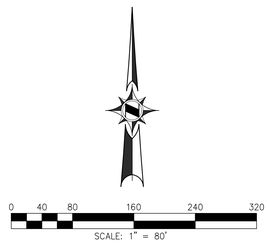
W.O. 4513-1 TRACT NO. 38066 TENTATIVE TRACT MAP

PLOTTED BY: Sophie Pham DATE: Apr. 26, 2023 11:56:09 AM FILE: F:\1244\Planning\SA_Site\Exh_TTM\SHT05.dwg

CITY OF SAN JACINTO

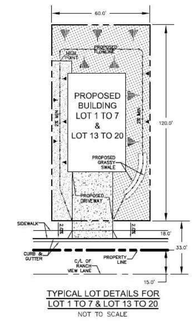
POST-CONSTRUCTION BMP SITE PLAN FOR SILVER BEACH VALLE RESEDA TRACT 38066



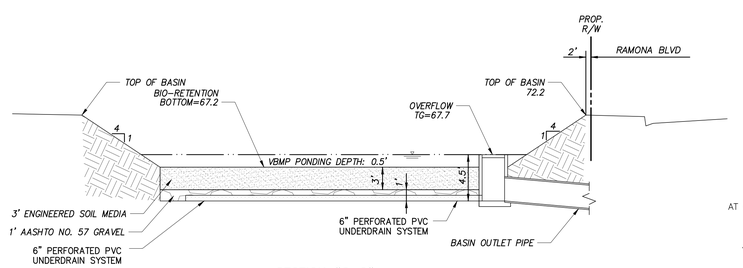


LEGEND

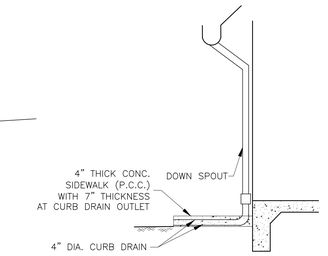
- D / 3.0 — DRAINAGE AREA / ACREAGE
- MAJOR DRAINAGE AREA BOUNDARY
- SUBAREA DRAINAGE BOUNDARY
- PROPOSED STORM DRAIN
- FLOW LINE (SURFACE FLOW)
- FLOW LINE (PIPE FLOW)
- 1 — NODE & NODE #
- EXISTING STORM DRAIN



TYPICAL LOT DETAILS FOR LOT 1 TO 7 & LOT 13 TO 20
NOT TO SCALE



SECTION "C–C"
NOT TO SCALE



ROOF DRAIN/DOWN SPOUT DETAIL
N.T.S.

REVISION			
DESCRIPTION	REC.	APPR.	DATE

REGISTERED PROFESSIONAL ENGINEER — TIN N. HUYNH — NO. 69273 — Exp. 06/30/24 — CIVIL — STATE OF CALIFORNIA

HUNSAKER & ASSOCIATES
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PREPARED UNDER THE SUPERVISION OF:

TIN N. HUYNH R.C.E. NO. 69273 DATE

CITY OF SAN JACINTO
CALIFORNIA

VALLE RESEDA

N. RAMONA BLVD SAN JANCINTO, CA 92582

SCALE: AS SHOWN

DRAWING NO. | PROJECT NO. | SHEET 6 OF 6 SHEETS

W.O. 4513-1 TRACT NO. 38066 TENTATIVE TRACT MAP

PLOTTED BY: Sophie Pham DATE: Apr. 26, 2023 11:54:48 AM FILE: F:\1244\Planning\SA_Site\Exh_TTM\SHT06.dwg

FIGURE 4

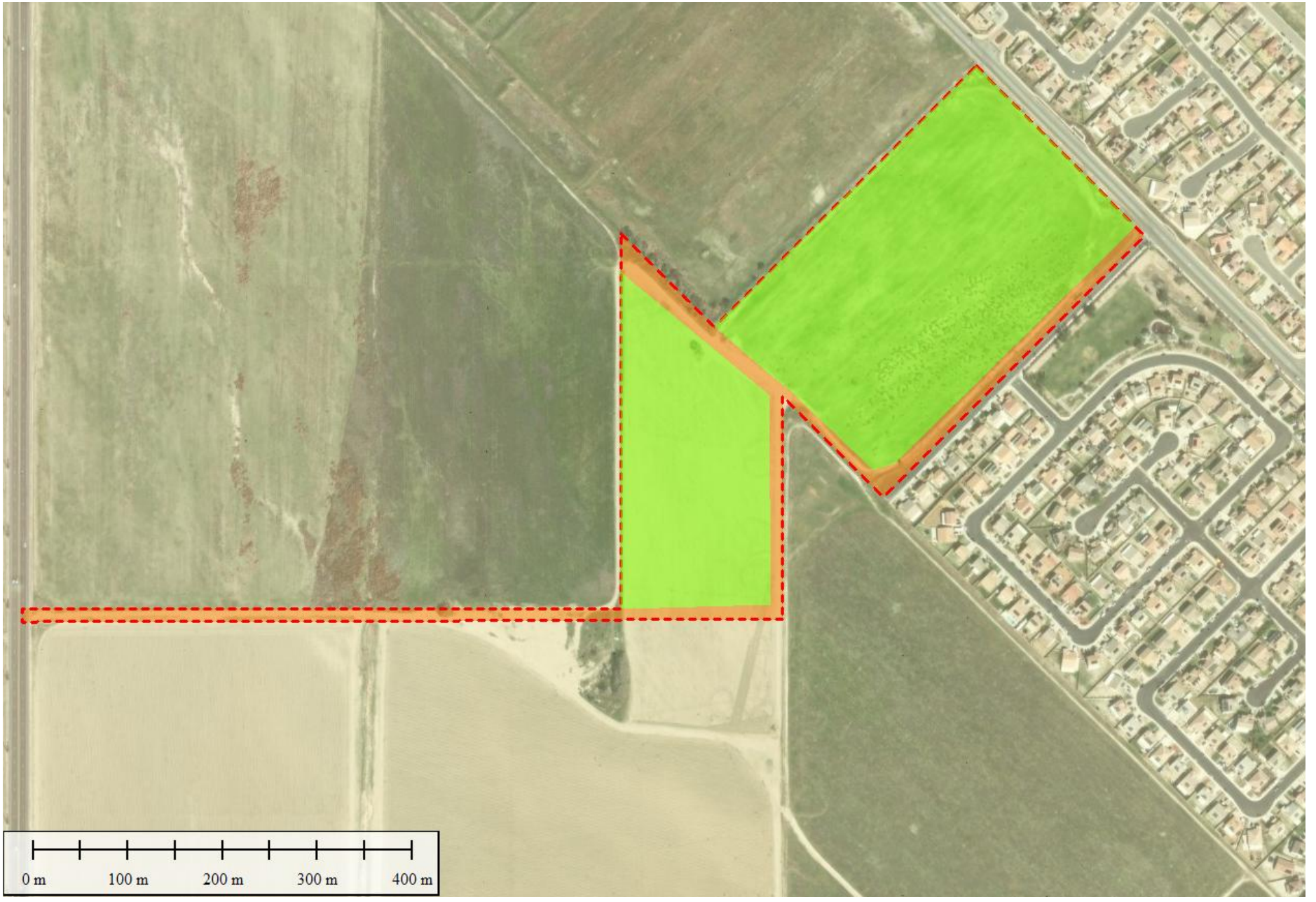

Figure 4
Habitat Map
TTM 38066
San Jacinto
Riverside County, California

Legend

- Property Line (37.87 Acres)
- Ruderal (31.42 Acres)
- Disturbed (6.45 Acres)

N

Hernandez Environmental Services

FIGURE 5

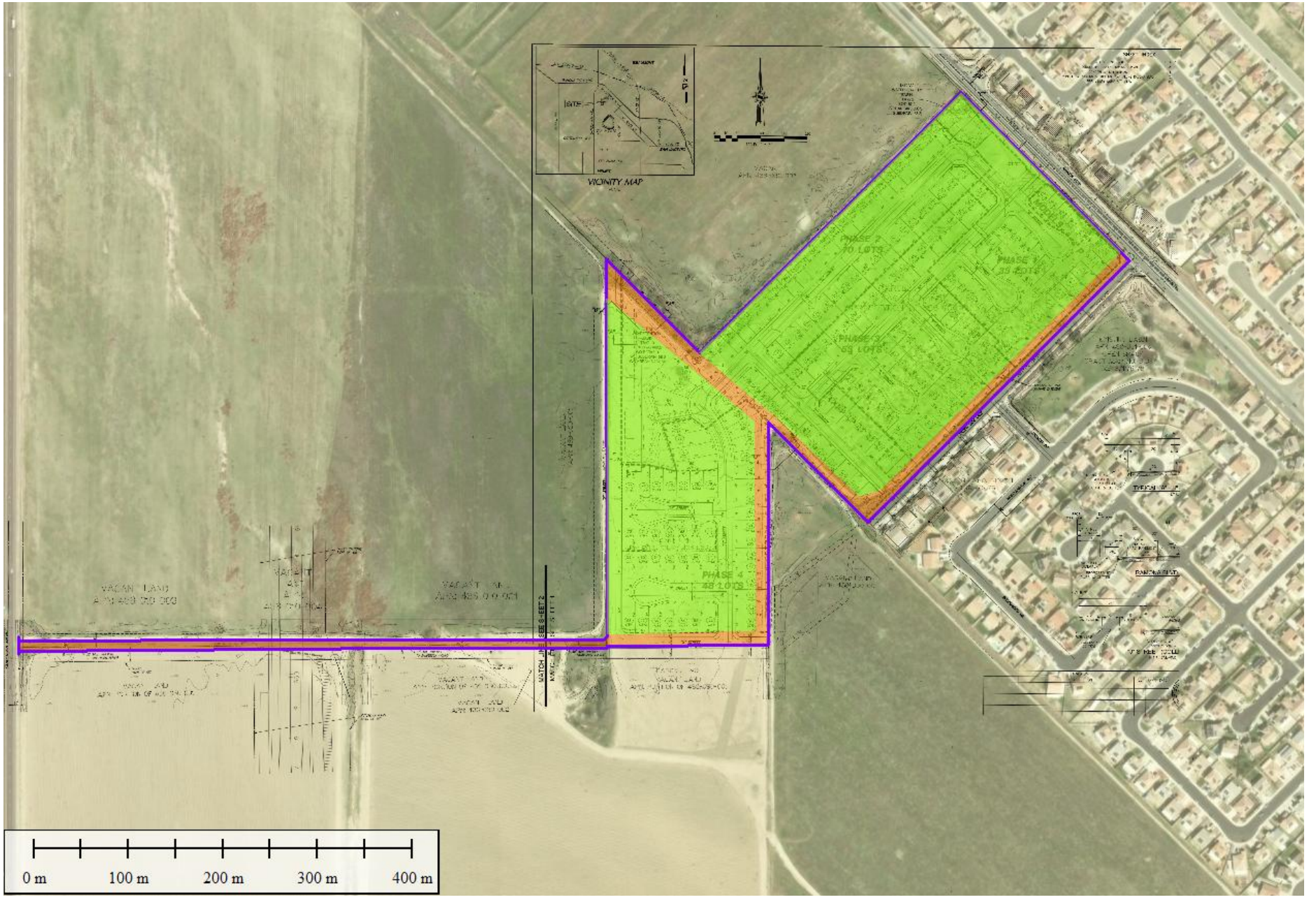

Figure 5
Limits of Impact Map
TTM 38066
San Jacinto
Riverside County, California

Legend

- Limits of Impact (39.46 Acres)
- Ruderal (31.42 Acres)
- Disturbed (8.04 Acres)

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APPENDIX A

Species List

Plant List

Ailanthus altissima	Tree of heaven
Amsinckia intermedia	Common fiddleneck
Bassia scoparia	Summer cypress
Brassica tournefortii	Asian mustard
Bromus madritensis	Red brome
Erodium cicutarium	Redstem filaree
Hirschfeldia incana	Shortpod mustard
Hordeum sp.	Barley
Lactuca serriola	Prickly lettuce
Malva parviflora	Cheeseweed
Marrubium vulgare	White horehound
Nicotiana attenuata	Coyote tobacco
Oncosiphon piluliferum	Stinknet
Populus fromontii	Fremont cottonwood
Salix gooddingii	Black willow
Salsola tragus	Tumbleweed
Sambucus sp.	Elderberry sp.

Animal List

Accipiter cooperii	Cooper's hawk
Charadrius vociferus	Killdeer
Haemorhous mexicanus	House finch
Spinus psaltria	Lesser goldfinch

APPENDIX B

Scientific Name	Common Name	Taxon Group	Federal List	State List	Rare Plant Rank	Habitats	General Habitat	Micro Habitat	Presence/ Absence
Abronia villosa var. aurita	chaparral sand-verbena	Dicots	None	None	1B.1	Chaparral | Coastal scrub | Desert dunes	Chaparral, coastal scrub, desert dunes.	Sandy areas. -60-1570 m.	No habitat for this species is present on the project site. **This species is not present.**
Allium marvinii	Yucaipa onion	Monocots	None	None	1B.2	Chaparral	Chaparral.	In openings on clay soils. 850-1070 m.	No habitat for this species is present on the project site. **This species is not present.**
Allium munzii	Munz's onion	Monocots	Endangered	Threatened	1B.1	Chaparral | Cismontane woodland | Coastal scrub | Pinon & juniper woodlands | Valley & foothill grassland	Chaparral, coastal scrub, cismontane woodland, pinyon and juniper woodland, valley and foothill grassland.	Heavy clay soils; grows in grasslands and openings within shrublands or woodlands. 375-1040 m.	No habitat for this species is present on the project site. **This species is not present.**

Astragalus hornii var. hornii	Horn's milk-vetch	Dicots	None	None	1B.1	Alkali playa | Meadow & seep | Wetland	Meadows and seeps, playas.	Lake margins, alkaline sites. 75-350 m.	No habitat for this species is present on the project site. **This species is not present.**
Astragalus lentiginosus var. coachellae	Coachella Valley milk-vetch	Dicots	Endangered	None	1B.2	Desert dunes | Sonoran desert scrub	Sonoran desert scrub, desert dunes.	Sandy flats, washes, outwash fans, sometimes on dunes. 35-695 m.	No habitat for this species is present on the project site. **This species is not present.**
Astragalus pachypus var. jaegeri	Jaeger's milk-vetch	Dicots	None	None	1B.1	Chaparral | Cismontane woodland | Coastal scrub | Valley & foothill grassland	Coastal scrub, chaparral, valley and foothill grassland, cismontane woodland.	Dry ridges and valleys and open sandy slopes; often in grassland and oak-chaparral. 365-1040 m.	No habitat for this species is present on the project site. **This species is not present.**

Atriplex coronata var. notatior	San Jacinto Valley crownscale	Dicots	Endangered	None	1B.1	Alkali playa | Valley & foothill grassland | Vernal pool | Wetland	Playas, valley and foothill grassland, vernal pools.	Alkaline areas in the San Jacinto River Valley. 35-460 m.	No habitat for this species is present on the project site. **This species is not present.**
Atriplex parishii	Parish's brittlescale	Dicots	None	None	1B.1	Alkali playa | Chenopod scrub | Meadow & seep | Vernal pool | Wetland	Vernal pools, chenopod scrub, playas.	Usually on drying alkali flats with fine soils. 4-1420 m.	No habitat for this species is present on the project site. **This species is not present.**
Atriplex serenana var. davidsonii	Davidson's saltscale	Dicots	None	None	1B.2	Coastal bluff scrub | Coastal scrub	Coastal bluff scrub, coastal scrub.	Alkaline soil. 0-480 m.	No habitat for this species is present on the project site. **This species is not present.**

Brodiaea filifolia	thread-leaved brodiaea	Monocots	Threatened	Endangered	1B.1	Chaparral | Cismontane woodland | Coastal scrub | Valley & foothill grassland | Vernal pool | Wetland	Chaparral (openings), cismontane woodland, coastal scrub, playas, valley and foothill grassland, vernal pools.	Usually associated with annual grassland and vernal pools; often surrounded by shrubland habitats. Occurs in openings on clay soils. 15-1030 m.	No habitat for this species is present on the project site. **This species is not present.**
Calochortus palmeri var. munzii	San Jacinto mariposa-lily	Monocots	None	None	1B.2	Chaparral | Lower montane coniferous forest | Meadow & seep	Lower montane coniferous forest, chaparral, meadows and seeps.	Seen in open Jeffrey pine forest as well as in chaparral. 940-1815 m.	No habitat for this species is present on the project site. **This species is not present.**
Calochortus palmeri var. palmeri	Palmer's mariposa-lily	Monocots	None	None	1B.2	Chaparral | Lower montane coniferous forest | Meadow & seep	Meadows and seeps, chaparral, lower montane coniferous forest.	Vernally moist places in yellow-pine forest, chaparral. 195-2530 m.	No habitat for this species is present on the project site. **This species is not present.**

Calochortus plummerae	Plummer's mariposa-lily	Monocots	None	None	4.2	Chaparral | Cismontane woodland | Coastal scrub | Lower montane coniferous forest | Valley & foothill grassland	Coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest.	Occurs on rocky and sandy sites, usually of granitic or alluvial material. Can be very common after fire. 60-2500 m.	No habitat for this species is present on the project site. **This species is not present.**
Calochortus weedii var. intermedius	intermediate mariposa-lily	Monocots	None	None	1B.2	Chaparral | Coastal scrub | Valley & foothill grassland	Coastal scrub, chaparral, valley and foothill grassland.	Dry, rocky calcareous slopes and rock outcrops. 60-1575 m.	No habitat for this species is present on the project site. **This species is not present.**
Canyon Live Oak Ravine Forest	Canyon Live Oak Ravine Forest	Riparian	None	None		Riparian forest			**This is not present.**
Caulanthus simulans	Payson's jewelflower	Dicots	None	None	4.2	Chaparral | Coastal scrub	Chaparral, coastal scrub.	Frequently in burned areas, or in disturbed sites such as streambeds; also on rocky, steep slopes. Sandy, granitic soils. 90-2200 m.	No habitat for this species is present on the project site. **This species is not present.**

Centromadia pungens ssp. laevis	smooth tarplant	Dicots	None	None	1B.1	Alkali playa | Chenopod scrub | Meadow & seep | Riparian woodland | Valley & foothill grassland | Wetland	Valley and foothill grassland, chenopod scrub, meadows and seeps, playas, riparian woodland.	Alkali meadow, alkali scrub; also in disturbed places. 5-1170 m.	No habitat for this species is present on the project site. **This species is not present.**
Chorizanthe parryi var. parryi	Parry's spineflower	Dicots	None	None	1B.1	Chaparral | Cismontane woodland | Coastal scrub | Valley & foothill grassland	Coastal scrub, chaparral, cismontane woodland, valley and foothill grassland.	Dry slopes and flats; sometimes at interface of 2 vegetation types, such as chaparral and oak woodland. Dry, sandy soils. 90-1220 m.	No habitat for this species is present on the project site. **This species is not present.**
Chorizanthe polygonoides var. longispina	long-spined spineflower	Dicots	None	None	1B.2	Chaparral | Coastal scrub | Meadow & seep | Ultramafic | Valley & foothill grassland | Vernal pool	Chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, vernal pools.	Gabbroic clay. 30-1630 m.	No habitat for this species is present on the project site. **This species is not present.**

Chorizanthe xanti var. leucotheca	white-bracted spineflower	Dicots	None	None	1B.2	Coastal scrub | Mojavean desert scrub | Pinon & juniper woodlands	Mojavean desert scrub, pinyon and juniper woodland, coastal scrub (alluvial fans).	Sandy or gravelly places. 365-1830 m.	No habitat for this species is present on the project site. **This species is not present.**
Deinandra mohavensis	Mojave tarplant	Dicots	None	Endangered	1B.3	Chaparral | Coastal scrub | Riparian scrub	Riparian scrub, coastal scrub, chaparral.	Low sand bars in river bed; mostly in riparian areas or in ephemeral grassy areas. 640-1645 m.	No habitat for this species is present on the project site. **This species is not present.**
Desert Fan Palm Oasis Woodland	Desert Fan Palm Oasis Woodland	Riparian	None	None		Riparian woodland			**This is not present.**
Dodecahema leptoceras	slender-horned spineflower	Dicots	Endangered	Endangered	1B.1	Chaparral | Cismontane woodland | Coastal scrub	Chaparral, cismontane woodland, coastal scrub (alluvial fan sage scrub).	Flood deposited terraces and washes; associates include Encelia, Dalea, Lepidospartum, etc. Sandy soils. 200-765 m.	No habitat for this species is present on the project site. **This species is not present.**

Galium angustifolium ssp. jacinticum	San Jacinto Mountains bedstraw	Dicots	None	None	1B.3	Lower montane coniferous forest	Lower montane coniferous forest.	Open mixed forest. 1190-2440 m.	No habitat for this species is present on the project site. **This species is not present.**
Galium californicum ssp. primum	Alvin Meadow bedstraw	Dicots	None	None	1B.2	Chaparral | Lower montane coniferous forest	Chaparral, lower montane coniferous forest.	Grows in shade of trees and shrubs at the lower edge of the pine belt, in pine forest-chaparral ecotone. Granitic, sandy soils. 1460-1830 m.	No habitat for this species is present on the project site. **This species is not present.**
Harpagonella palmeri	Palmer's grapplinghook	Dicots	None	None	4.2	Chaparral | Coastal scrub | Valley & foothill grassland	Chaparral, coastal scrub, valley and foothill grassland.	Clay soils; open grassy areas within shrubland. 20-955 m.	No habitat for this species is present on the project site. **This species is not present.**

Horkelia cuneata var. puberula	mesa horkelia	Dicots	None	None	1B.1	Chaparral | Cismontane woodland | Coastal scrub	Chaparral, cismontane woodland, coastal scrub.	Sandy or gravelly sites. 15-1645 m.	No habitat for this species is present on the project site. **This species is not present.**
Imperata brevifolia	California satintail	Monocots	None	None	2B.1	Chaparral | Coastal scrub | Meadow & seep | Mojavean desert scrub | Riparian scrub | Wetland	Coastal scrub, chaparral, riparian scrub, mojavean desert scrub, meadows and seeps (alkali), riparian scrub.	Mesic sites, alkali seeps, riparian areas. 3-1495 m.	No habitat for this species is present on the project site. **This species is not present.**
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	Dicots	None	None	1B.1	Alkali playa | Marsh & swamp | Salt marsh | Vernal pool | Wetland	Coastal salt marshes, playas, vernal pools.	Usually found on alkaline soils in playas, sinks, and grasslands. 1-1375 m.	No habitat for this species is present on the project site. **This species is not present.**

Lepidium virginicum var. robinsonii	Robinson's pepper-grass	Dicots	None	None	4.3	Chaparral | Coastal scrub	Chaparral, coastal scrub.	Dry soils, shrubland. 4-1435 m.	No habitat for this species is present on the project site. **This species is not present.**
Lilium parryi	lemon lily	Monocots	None	None	1B.2	Lower montane coniferous forest | Meadow & seep | Riparian forest | Upper montane coniferous forest | Wetland	Lower montane coniferous forest, meadows and seeps, riparian forest, upper montane coniferous forest.	Wet, mountainous terrain; generally in forested areas; on shady edges of streams, in open boggy meadows and seeps. 625-2930 m.	No habitat for this species is present on the project site. **This species is not present.**
Mentzelia tricuspis	spiny-hair blazing star	Dicots	None	None	2B.1	Mojavean desert scrub	Mojavean desert scrub.	Sandy or gravelly slopes and washes.150-1280 m.	No habitat for this species is present on the project site. **This species is not present.**

Monardella nana ssp. leptosiphon	San Felipe monardella	Dicots	None	None	1B.2	Chaparral | Lower montane coniferous forest	Chaparral, lower montane coniferous forest.	Sometimes in openings and fuelbreaks or in the understory of forest or chaparral. 850-2425 m.	No habitat for this species is present on the project site. **This species is not present.**
Myosurus minimus ssp. apus	little mousetail	Dicots	None	None	3.1	Valley & foothill grassland | Vernal pool | Wetland	Vernal pools, valley and foothill grassland.	Alkaline soils. 20-640 m.	No habitat for this species is present on the project site. **This species is not present.**
Nama stenocarpa	mud nama	Dicots	None	None	2B.2	Marsh & swamp | Wetland	Marshes and swamps.	Lake shores, river banks, intermittently wet areas. 15-815 m.	No habitat for this species is present on the project site. **This species is not present.**

Navarretia fossalis	spreading navarretia	Dicots	Threatened	None	1B.1	Alkali playa | Chenopod scrub | Marsh & swamp | Vernal pool | Wetland	Vernal pools, chenopod scrub, marshes and swamps, playas.	San Diego hardpan and San Diego claypan vernal pools; in swales and vernal pools, often surrouded by other habitat types. 15-850 m.	No habitat for this species is present on the project site. **This species is not present.**
Orcuttia californica	California Orcutt grass	Monocots	Endangered	Endangered	1B.1	Vernal pool | Wetland	Vernal pools.	10-660 m.	No habitat for this species is present on the project site. **This species is not present.**
Penstemon californicus	California beardtongue	Dicots	None	None	1B.2	Chaparral | Lower montane coniferous forest | Pinon & juniper woodlands	Chaparral, lower montane coniferous forest, pinyon and juniper woodland.	Stony slopes and shrubby openings; sandy or granitic soils. 240-2290 m.	No habitat for this species is present on the project site. **This species is not present.**

Petalonyx linearis	narrow-leaf sandpaper-plant	Dicots	None	None	2B.3	Mojavean desert scrub | Sonoran desert scrub	Mojavean desert scrub, Sonoran desert scrub.	Sandy or rocky canyons. -30-1090 m.	No habitat for this species is present on the project site. **This species is not present.**
Pseudognaphalium leucocephalum	white rabbit-tobacco	Dicots	None	None	2B.2	Chaparral | Cismontane woodland | Coastal scrub | Riparian woodland	Riparian woodland, cismontane woodland, coastal scrub, chaparral.	Sandy, gravelly sites. 35-515 m.	No habitat for this species is present on the project site. **This species is not present.**
Saltugilia latimeri	Latimer's woodland-gilia	Dicots	None	None	1B.2	Chaparral | Limestone | Mojavean desert scrub | Pinon & juniper woodlands	Chaparral, Mojavean desert scrub, pinyon and juniper woodland.	Rocky or sandy substrate; sometimes in washes, sometimes limestone. 120-2200 m.	No habitat for this species is present on the project site. **This species is not present.**

Scutellaria bolanderi ssp. austromontana	southern mountains skullcap	Dicots	None	None	1B.2	Chaparral | Cismontane woodland | Lower montane coniferous forest	Chaparral, cismontane woodland, lower montane coniferous forest.	In gravelly soils on streambanks or in mesic sites in oak or pine woodland. 425-2000 m.	No habitat for this species is present on the project site. **This species is not present.**
Sidalcea neomexicana	salt spring checkerbloom	Dicots	None	None	2B.2	Alkali playa | Chaparral | Coastal scrub | Lower montane coniferous forest | Mojavean desert scrub | Wetland	Playas, chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub.	Alkali springs and marshes. 3-2380 m.	No habitat for this species is present on the project site. **This species is not present.**
Southern Coast Live Oak Riparian Forest	Southern Coast Live Oak Riparian Forest	Riparian	None	None		Riparian forest			**This is not present.**
Southern Cottonwood Willow Riparian Forest	Southern Cottonwood Willow Riparian Forest	Riparian	None	None		Riparian forest			**This is not present.**
Southern Mixed Riparian Forest	Southern Mixed Riparian Forest	Riparian	None	None		Riparian forest			**This is not present.**
Southern Riparian Scrub	Southern Riparian Scrub	Riparian	None	None		Riparian scrub			**This is not present.**

Southern Sycamore Alder Riparian Woodland	Southern Sycamore Alder Riparian Woodland	Riparian	None	None		Riparian woodland			**This is not present.**
Streptanthus bernardinus	Laguna Mountains jewelflower	Dicots	None	None	4.3	Chaparral | Lower montane coniferous forest | Upper montane coniferous forest	Chaparral, lower montane coniferous forest.	Clay or decomposed granite soils; sometimes in disturbed areas such as streamsides or roadcuts. 1440-2500 m.	No habitat for this species is present on the project site. **This species is not present.**
Symphyotrichum defoliatum	San Bernardino aster	Dicots	None	None	1B.2	Cismontane woodland | Coastal scrub | Lower montane coniferous forest | Marsh & swamp | Meadow & seep | Valley & foothill grassland	Meadows and seeps, cismontane woodland, coastal scrub, lower montane coniferous forest, marshes and swamps, valley and foothill grassland.	Vernally mesic grassland or near ditches, streams and springs; disturbed areas. 3-2045 m.	No habitat for this species is present on the project site. **This species is not present.**

Tortula californica	California screw moss	Bryophytes	None	None	1B.2	Chenopod scrub | Valley & foothill grassland	Chenopod scrub, valley and foothill grassland.	Moss growing on sandy soil. 45-750 m.	No habitat for this species is present on the project site. **This species is not present.**
Trichocoronis wrightii var. wrightii	Wright's trichocoronis	Dicots	None	None	2B.1	Marsh & swamp | Meadow & seep | Riparian forest | Vernal pool | Wetland	Marshes and swamps, riparian forest, meadows and seeps, vernal pools.	Mud flats of vernal lakes, drying river beds, alkali meadows. 5-435 m.	No habitat for this species is present on the project site. **This species is not present.**

Scientific Name	Common Name	Taxon Group	Federal List	State List	Other Status	Habitats	General Habitat	Micro Habitat	Presence/ Absence
Accipiter cooperii	Cooper's hawk	Birds	None	None	CDFW_WL-Watch List | IUCN_LC-Least Concern	Cismontane woodland | Riparian forest | Riparian woodland | Upper montane coniferous forest	Woodland, chiefly of open, interrupted or marginal type.	Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	No habitat for this species is present on the project site. **This species is not present.**
Agelaius tricolor	tricolored blackbird	Birds	None	Threatened	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_EN-Endangered | USFWS_BCC-Birds of Conservation Concern	Freshwater marsh | Marsh & swamp | Swamp | Wetland	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California.	Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	No habitat for this species is present on the project site. **This species is not present.**

Aimophila ruficeps canescens	southern California rufous-crowned sparrow	Birds	None	None	CDFW_WL-Watch List	Chaparral | Coastal scrub	Resident in Southern California coastal sage scrub and sparse mixed chaparral.	Frequents relatively steep, often rocky hillsides with grass and forb patches.	No habitat for this species is present on the project site. **This species is not present.**
Anaxyrus californicus	arroyo toad	Amphibians	Endangered	None	CDFW_SSC-Species of Special Concern | IUCN_EN-Endangered	Desert wash | Riparian scrub | Riparian woodland | South coast flowing waters | South coast standing waters	Semi-arid regions near washes or intermittent streams, including valley-foothill and desert riparian, desert wash, etc.	Rivers with sandy banks, willows, cottonwoods, and sycamores; loose, gravelly areas of streams in drier parts of range.	No habitat for this species is present on the project site. **This species is not present.**

Anniella stebbinsi	Southern California legless lizard	Reptiles	None	None	CDFW_SSC-Species of Special Concern | USFS_S-Sensitive	Broadleaved upland forest | Chaparral | Coastal dunes | Coastal scrub	Generally south of the Transverse Range, extending to northwestern Baja California. Occurs in sandy or loose loamy soils under sparse vegetation. Disjunct populations in the Tehachapi and Piute Mountains in Kern County.	Variety of habitats; generally in moist, loose soil. They prefer soils with a high moisture content.	No habitat for this species is present on the project site. **This species is not present.**

Antrozous pallidus	pallid bat	Mammals	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive	Chaparral | Coastal scrub | Desert wash | Great Basin grassland | Great Basin scrub | Mojavean desert scrub | Riparian woodland | Sonoran desert scrub | Upper montane coniferous forest | Valley & foothill grassland	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting.	Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	No habitat for this species is present on the project site. **This species is not present.**

Aquila chrysaetos	golden eagle	Birds	None	None	BLM_S-Sensitive | CDF_S-Sensitive | CDFW_FP-Fully Protected | CDFW_WL-Watch List | IUCN_LC-Least Concern	Broadleaved upland forest | Cismontane woodland | Coastal prairie | Great Basin grassland | Great Basin scrub | Lower montane coniferous forest | Pinon & juniper woodlands | Upper montane coniferous forest | Valley & foothill grassland	Rolling foothills, mountain areas, sage-juniper flats, and desert.	Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	No habitat for this species is present on the project site. **This species is not present.**

Arizona elegans occidentalis	California glossy snake	Reptiles	None	None	CDFW_SSC-Species of Special Concern		Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular ranges, south to Baja California.	Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils.	No habitat for this species is present on the project site. **This species is not present.**
Artemisiospiza belli belli	Bell's sparrow	Birds	None	None	CDFW_WL-Watch List	Chaparral | Coastal scrub	Nests in chaparral dominated by fairly dense stands of chamise. Found in coastal sage scrub in south of range.	Nest located on the ground beneath a shrub or in a shrub 6-18 inches above ground. Territories about 50 yds apart.	No habitat for this species is present on the project site. **This species is not present.**

Aspidoscelis hyperythra	orange-throated whiptail	Reptiles	None	None	CDFW_WL-Watch List | IUCN_LC-Least Concern | USFS_S-Sensitive	Chaparral | Cismontane woodland | Coastal scrub	Inhabits low-elevation coastal scrub, chaparral, and valley-foothill hardwood habitats.	Prefers washes and other sandy areas with patches of brush and rocks. Perennial plants necessary for its major food: termites.	No habitat for this species is present on the project site. **This species is not present.**
Aspidoscelis tigris stejnegeri	coastal whiptail	Reptiles	None	None	CDFW_SSC-Species of Special Concern		Found in deserts and semi-arid areas with sparse vegetation and open areas. Also found in woodland and riparian areas.	Ground may be firm soil, sandy, or rocky.	No habitat for this species is present on the project site. **This species is not present.**

Athene cunicularia	burrowing owl	Birds	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFWS_BCC-Birds of Conservation Concern	Coastal prairie | Coastal scrub | Great Basin grassland | Great Basin scrub | Mojavean desert scrub | Sonoran desert scrub | Valley & foothill grassland	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation.	Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Suitable habitat for this species is present on the project site. This species was not observed during focused surveys. **This species is not present.**
Bombus crotchii	Crotch bumble bee	Insects	None	Candidate Endangered	IUCN_EN-Endangered		Coastal California east to the Sierra-Cascade crest and south into Mexico.	Food plant genera include Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, and Eriogonum.	No habitat for this species is present on the project site. **This species is not present.**

Branchinecta lynchi	vernal pool fairy shrimp	Crustaceans	Threatened	None	IUCN_VU-Vulnerable	Valley & foothill grassland | Vernal pool | Wetland	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain-filled pools.	Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	No habitat for this species is present on the project site. **This species is not present.**
Buteo regalis	ferruginous hawk	Birds	None	None	CDFW_WL-Watch List | IUCN_LC-Least Concern	Great Basin grassland | Great Basin scrub | Pinon & juniper woodlands | Valley & foothill grassland	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats.	Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.	No habitat for this species is present on the project site. **This species is not present.**
Campylorhynchus brunneicapillus sandiegensis	coastal cactus wren	Birds	None	None	CDFW_SSC-Species of Special Concern | USFS_S-Sensitive | USFWS_BCC-Birds of Conservation Concern	Coastal scrub	Southern California coastal sage scrub.	Wrens require tall opuntia cactus for nesting and roosting.	No habitat for this species is present on the project site. **This species is not present.**

Chaetodipus californicus femoralis	Dulzura pocket mouse	Mammals	None	None	CDFW_SSC-Species of Special Concern	Chaparral | Coastal scrub | Valley & foothill grassland	Variety of habitats including coastal scrub, chaparral and grassland in San Diego County.	Attracted to grass-chaparral edges.	No habitat for this species is present on the project site. **This species is not present.**
Chaetodipus fallax fallax	northwestern San Diego pocket mouse	Mammals	None	None	CDFW_SSC-Species of Special Concern	Chaparral | Coastal scrub	Coastal scrub, chaparral, grasslands, sagebrush, etc. in western San Diego County.	Sandy, herbaceous areas, usually in association with rocks or coarse gravel.	No habitat for this species is present on the project site. **This species is not present.**
Chaetodipus fallax pallidus	pallid San Diego pocket mouse	Mammals	None	None	CDFW_SSC-Species of Special Concern	Desert wash | Pinon & juniper woodlands | Sonoran desert scrub	Desert border areas in eastern San Diego County in desert wash, desert scrub, desert succulent scrub, pinyon-juniper, etc.	Sandy, herbaceous areas, usually in association with rocks or coarse gravel.	No habitat for this species is present on the project site. **This species is not present.**

Charina umbratica	southern rubber boa	Reptiles	None	Threatened	IUCN_VU-Vulnerable | USFS_S-Sensitive	Meadow & seep | Riparian forest | Riparian woodland | Upper montane coniferous forest | Wetland	Found in a variety of montane forest habitats. Previously considered morphologically intermediate, recent (2022) genomic analysis clarifies individuals from Mt Pinos, Tehachapi Mts, and southern Sierra Nevada are southern rubber boa.	Found in vicinity of streams or wet meadows; requires loose, moist soil for burrowing; seeks cover in rotting logs, rock outcrops, and under surface litter.	No habitat for this species is present on the project site. **This species is not present.**
Circus hudsonius	northern harrier	Birds	None	None	CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFWS_BCC-Birds of Conservation Concern	Coastal scrub | Great Basin grassland | Marsh & swamp | Riparian scrub | Valley & foothill grassland | Wetland	Coastal salt and freshwater marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain cienagas.	Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	No habitat for this species is present on the project site. **This species is not present.**

Coccyzus americanus occidentalis	western yellow-billed cuckoo	Birds	Threatened	Endangered	BLM_S-Sensitive | USFS_S-Sensitive	Riparian forest	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems.	Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	No habitat for this species is present on the project site. **This species is not present.**
Coleonyx variegatus abbotti	San Diego banded gecko	Reptiles	None	None	CDFW_SSC-Species of Special Concern	Chaparral | Coastal scrub	Coastal and cismontane Southern California.	Found in granite or rocky outcrops in coastal scrub and chaparral habitats.	No habitat for this species is present on the project site. **This species is not present.**

Corynorhinus townsendii	Townsend's big-eared bat	Mammals	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive	Broadleaved upland forest | Chaparral | Chenopod scrub | Great Basin grassland | Great Basin scrub | Joshua tree woodland | Lower montane coniferous forest | Meadow & seep | Mojavean desert scrub | Riparian forest | Riparian woodland | Sonoran desert scrub | Sonoran thorn woodland | Upper montane coniferous forest | Valley & foothill	Throughout California in a wide variety of habitats. Most common in mesic sites.	Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	No habitat for this species is present on the project site. **This species is not present.**

Crotalus ruber	red-diamond rattlesnake	Reptiles	None	None	CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive	Chaparral | Mojavean desert scrub | Sonoran desert scrub	Chaparral, woodland, grassland, and desert areas from coastal San Diego County to the eastern slopes of the mountains.	Occurs in rocky areas and dense vegetation. Needs rodent burrows, cracks in rocks or surface cover objects.	No habitat for this species is present on the project site. **This species is not present.**
Cypseloides niger	black swift	Birds	None	None	CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable | USFWS_BCC-Birds of Conservation Concern		Coastal belt of Santa Cruz and Monterey counties; central and southern Sierra Nevada; San Bernardino and San Jacinto mountains.	Breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above the surf; forages widely.	No habitat for this species is present on the project site. **This species is not present.**
Dipodomys merriami parvus	San Bernardino kangaroo rat	Mammals	Endangered	Candidate Endangered	CDFW_SSC-Species of Special Concern	Coastal scrub	Alluvial scrub vegetation on sandy loam substrates characteristic of alluvial fans and flood plains.	Needs early to intermediate seral stages.	No habitat for this species is present on the project site. **This species is not present.**

Dipodomys stephensi	Stephens' kangaroo rat	Mammals	Threatened	Threatened	IUCN_VU-Vulnerable	Coastal scrub | Valley & foothill grassland	Primarily annual and perennial grasslands, but also occurs in coastal scrub and sagebrush with sparse canopy cover.	Prefers buckwheat, chamise, brome grass and filaree. Will burrow into firm soil.	No habitat for this species is present on the project site. **This species is not present.**
Elanus leucurus	white-tailed kite	Birds	None	None	BLM_S-Sensitive | CDFW_FP-Fully Protected | IUCN_LC-Least Concern	Cismontane woodland | Marsh & swamp | Riparian woodland | Valley & foothill grassland | Wetland	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland.	Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	No habitat for this species is present on the project site. **This species is not present.**
Empidonax traillii extimus	southwestern willow flycatcher	Birds	Endangered	Endangered		Riparian woodland	Riparian woodlands in Southern California.		No habitat for this species is present on the project site. **This species is not present.**

Emys marmorata	western pond turtle	Reptiles	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable | USFS_S-Sensitive	Aquatic | Artificial flowing waters | Klamath/North coast flowing waters | Klamath/North coast standing waters | Marsh & swamp | Sacramento/San Joaquin flowing waters | Sacramento/San Joaquin standing waters | South coast flowing waters | South coast standing waters | Wetland	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation.	Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	No habitat for this species is present on the project site. **This species is not present.**

Eremophila alpestris actia	California horned lark	Birds	None	None	CDFW_WL-Watch List | IUCN_LC-Least Concern	Marine intertidal & splash zone communities | Meadow & seep	Coastal regions, chiefly from Sonoma County to San Diego County. Also main part of San Joaquin Valley and east to foothills.	Short-grass prairie, "bald" hills, mountain meadows, open coastal plains, fallow grain fields, alkali flats.	No habitat for this species is present on the project site. **This species is not present.**
Eumops perotis californicus	western mastiff bat	Mammals	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern	Chaparral | Cismontane woodland | Coastal scrub | Valley & foothill grassland	Many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral, etc.	Roosts in crevices in cliff faces, high buildings, trees and tunnels.	No habitat for this species is present on the project site. **This species is not present.**
Euphydryas editha quino	quino checkerspot butterfly	Insects	Endangered	None		Chaparral | Coastal scrub	Sunny openings within chaparral and coastal sage shrublands in parts of Riverside and San Diego counties.	Hills and mesas near the coast. Need high densities of food plants Plantago erecta, P. insularis, and Orthocarpus purpurescens.	No habitat for this species is present on the project site. **This species is not present.**

Icteria virens	yellow-breasted chat	Birds	None	None	CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Riparian forest | Riparian scrub | Riparian woodland	Summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses.	Nests in low, dense riparian, consisting of willow, blackberry, wild grape; forages and nests within 10 ft of ground.	No habitat for this species is present on the project site. **This species is not present.**
Lanius ludovicianus	loggerhead shrike	Birds	None	None	CDFW_SSC-Species of Special Concern | IUCN_NT-Near Threatened	Broadleaved upland forest | Desert wash | Joshua tree woodland | Mojavean desert scrub | Pinon & juniper woodlands | Riparian woodland | Sonoran desert scrub	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub and washes.	Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	No habitat for this species is present on the project site. **This species is not present.**

Lasiurus xanthinus	western yellow bat	Mammals	None	None	CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Desert wash	Found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats.	Roosts in trees, particularly palms. Forages over water and among trees.	No habitat for this species is present on the project site. **This species is not present.**
Lepus californicus bennettii	San Diego black-tailed jackrabbit	Mammals	None	None		Coastal scrub	Intermediate canopy stages of shrub habitats and open shrub / herbaceous and tree / herbaceous edges.	Coastal sage scrub habitats in Southern California.	No habitat for this species is present on the project site. **This species is not present.**
Neolarra alba	white cuckoo bee	Insects	None	None			Known only from localities in Southern California.	Cleptoparasitic in the nests of perdita bees.	No habitat for this species is present on the project site. **This species is not present.**

Neotoma lepida intermedia	San Diego desert woodrat	Mammals	None	None	CDFW_SSC-Species of Special Concern	Coastal scrub	Coastal scrub of Southern California from San Diego County to San Luis Obispo County.	Moderate to dense canopies preferred. They are particularly abundant in rock outcrops, rocky cliffs, and slopes.	No habitat for this species is present on the project site. **This species is not present.**
Onychomys torridus ramona	southern grasshopper mouse	Mammals	None	None	CDFW_SSC-Species of Special Concern	Chenopod scrub	Desert areas, especially scrub habitats with friable soils for digging. Prefers low to moderate shrub cover.	Feeds almost exclusively on arthropods, especially scorpions and orthopteran insects.	No habitat for this species is present on the project site. **This species is not present.**
Palaeoxenus dohrni	Dohrn's elegant eucnemid beetle	Insects	None	None					No habitat for this species is present on the project site. **This species is not present.**

Perognathus longimembris brevinasus	Los Angeles pocket mouse	Mammals	None	None	CDFW_SSC-Species of Special Concern	Coastal scrub	Lower elevation grasslands and coastal sage communities in and around the Los Angeles Basin.	Open ground with fine, sandy soils. May not dig extensive burrows, hiding under weeds and dead leaves instead.	No habitat for this species is present on the project site. **This species is not present.**
Phrynosoma blainvillii	coast horned lizard	Reptiles	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Chaparral | Cismontane woodland | Coastal bluff scrub | Coastal scrub | Desert wash | Pinon & juniper woodlands | Riparian scrub | Riparian woodland | Valley & foothill grassland	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes.	Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	No habitat for this species is present on the project site. **This species is not present.**

Plegadis chihi	white-faced ibis	Birds	None	None	CDFW_WL-Watch List | IUCN_LC-Least Concern	Marsh & swamp | Wetland	Shallow freshwater marsh.	Dense tule thickets for nesting, interspersed with areas of shallow water for foraging.	No habitat for this species is present on the project site. **This species is not present.**
Polioptila californica californica	coastal California gnatcatcher	Birds	Threatened	None	CDFW_SSC-Species of Special Concern	Coastal bluff scrub | Coastal scrub	Obligate, permanent resident of coastal sage scrub below 2500 ft in Southern California.	Low, coastal sage scrub in arid washes, on mesas and slopes. Not all areas classified as coastal sage scrub are occupied.	No habitat for this species is present on the project site. **This species is not present.**
Progne subis	purple martin	Birds	None	None	CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Broadleaved upland forest | Lower montane coniferous forest	Inhabits woodlands, low elevation coniferous forest of Douglas-fir, ponderosa pine, and Monterey pine.	Nests in old woodpecker cavities mostly; also in human-made structures. Nest often located in tall, isolated tree/snag.	No habitat for this species is present on the project site. **This species is not present.**

Rana muscosa	southern mountain yellow-legged frog	Amphibians	Endangered	Endangered	CDFW_WL-Watch List | IUCN_EN-Endangered | USFS_S-Sensitive	Aquatic	Disjunct populations known from southern Sierras (northern DPS) and San Gabriel, San Bernardino, and San Jacinto Mtns (southern DPS). Found at 1,000 to 12,000 ft in lakes and creeks that stem from springs and snowmelt. May overwinter under frozen lakes.	Often encountered within a few feet of water. Tadpoles may require 2 - 4 yrs to complete their aquatic development.	No habitat for this species is present on the project site. **This species is not present.**
Salvadora hexalepis virgultea	coast patch-nosed snake	Reptiles	None	None	CDFW_SSC-Species of Special Concern	Coastal scrub	Brushy or shrubby vegetation in coastal Southern California.	Require small mammal burrows for refuge and overwintering sites.	No habitat for this species is present on the project site. **This species is not present.**

Setophaga petechia	yellow warbler	Birds	None	None	CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Riparian forest | Riparian scrub | Riparian woodland	Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada.	Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	No habitat for this species is present on the project site. **This species is not present.**
Socalchemmis icenoglei	Icenogle's socalchemmis spider	Arachnids	None	None		Coastal scrub	Known only from the type locality in the vicinity of Winchester, Riverside County.		No habitat for this species is present on the project site. **This species is not present.**

Spea hammondii	western spadefoot	Amphibians	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_NT-Near Threatened	Cismontane woodland | Coastal scrub | Valley & foothill grassland | Vernal pool | Wetland	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands.	Vernal pools are essential for breeding and egg-laying.	No habitat for this species is present on the project site. **This species is not present.**
Spinus lawrencei	Lawrence's goldfinch	Birds	None	None	IUCN_LC-Least Concern | USFWS_BCC-Birds of Conservation Concern	Broadleaved upland forest | Chaparral | Pinon & juniper woodlands | Riparian woodland	Nests in open oak or other arid woodland and chaparral, near water. Nearby herbaceous habitats used for feeding.	Closely associated with oaks.	No habitat for this species is present on the project site. **This species is not present.**
Stenopelmatus cahuilaensis	Coachella Valley jerusalem cricket	Insects	None	None	IUCN_VU-Vulnerable	Desert dunes	Inhabits a small segment of the sand and dune areas of the Coachella Valley, in the vicinity of Palm Springs.	Found in the large, undulating dunes piled up at the north base of Mt San Jacinto.	No habitat for this species is present on the project site. **This species is not present.**

Streptocephalus woottoni	Riverside fairy shrimp	Crustaceans	Endangered	None	IUCN_EN-Endangered	Coastal scrub | Valley & foothill grassland | Vernal pool | Wetland	Endemic to Western Riverside, Orange, and San Diego counties in areas of tectonic swales/earth slump basins in grassland and coastal sage scrub.	Inhabit seasonally astatic pools filled by winter/spring rains. Hatch in warm water later in the season.	No habitat for this species is present on the project site. **This species is not present.**

Taxidea taxus	American badger	Mammals	None	None	CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Alkali marsh | Alkali playa | Alpine | Alpine dwarf scrub | Bog & fen | Brackish marsh | Broadleaved upland forest | Chaparral | Chenopod scrub | Cismontane woodland | Closed-cone coniferous forest | Coastal bluff scrub | Coastal dunes | Coastal prairie | Coastal scrub | Desert dunes | Desert wash | Freshwater marsh | Great Basin grassland | Great Basin scrub | Interior dunes | Ione	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	No habitat for this species is present on the project site. **This species is not present.**

Toxostoma lecontei	Le Conte's thrasher	Birds	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFWS_BCC-Birds of Conservation Concern	Desert wash | Mojavean desert scrub | Sonoran desert scrub	Desert resident; primarily of open desert wash, desert scrub, alkali desert scrub, and desert succulent scrub habitats.	Commonly nests in a dense, spiny shrub or densely branched cactus in desert wash habitat, usually 2-8 feet above ground.	No habitat for this species is present on the project site. **This species is not present.**
Vireo bellii pusillus	least Bell's vireo	Birds	Endangered	Endangered		Riparian forest | Riparian scrub | Riparian woodland	Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 ft.	Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, Baccharis, mesquite.	No habitat for this species is present on the project site. **This species is not present.**

Xanthocephalus xanthocephalus	yellow-headed blackbird	Birds	None	None	CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Marsh & swamp | Wetland	Nests in freshwater emergent wetlands with dense vegetation and deep water. Often along borders of lakes or ponds.	Nests only where large insects such as Odonata are abundant, nesting timed with maximum emergence of aquatic insects.	No habitat for this species is present on the project site. **This species is not present.**
Xerospermophilus tereticaudus chlorus	Palm Springs round-tailed ground squirrel	Mammals	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern	Chenopod scrub | Sonoran desert scrub	Restricted to the Coachella Valley. Prefers desert succulent scrub, desert wash, desert scrub, alkali scrub, and levees.	Prefers open, flat, grassy areas in fine-textured, sandy soil. Density correlated with winter rainfall.	No habitat for this species is present on the project site. **This species is not present.**

APPENDIX C



View of ruderal habitat onsite where impacts will occur. View looking northwest



View of recently tilled area on site. View looking southwest.



View of ruderal area on site followed by N Ramona Boulevard. View looking northwest.

Hernandez Environmental Services



View of Fremont cottonwood (*Populus fremontii*) surrounded by ruderal vegetation onsite. View looking south.



View disturbed road onsite to be improved between agricultural fields off site. View looking west.

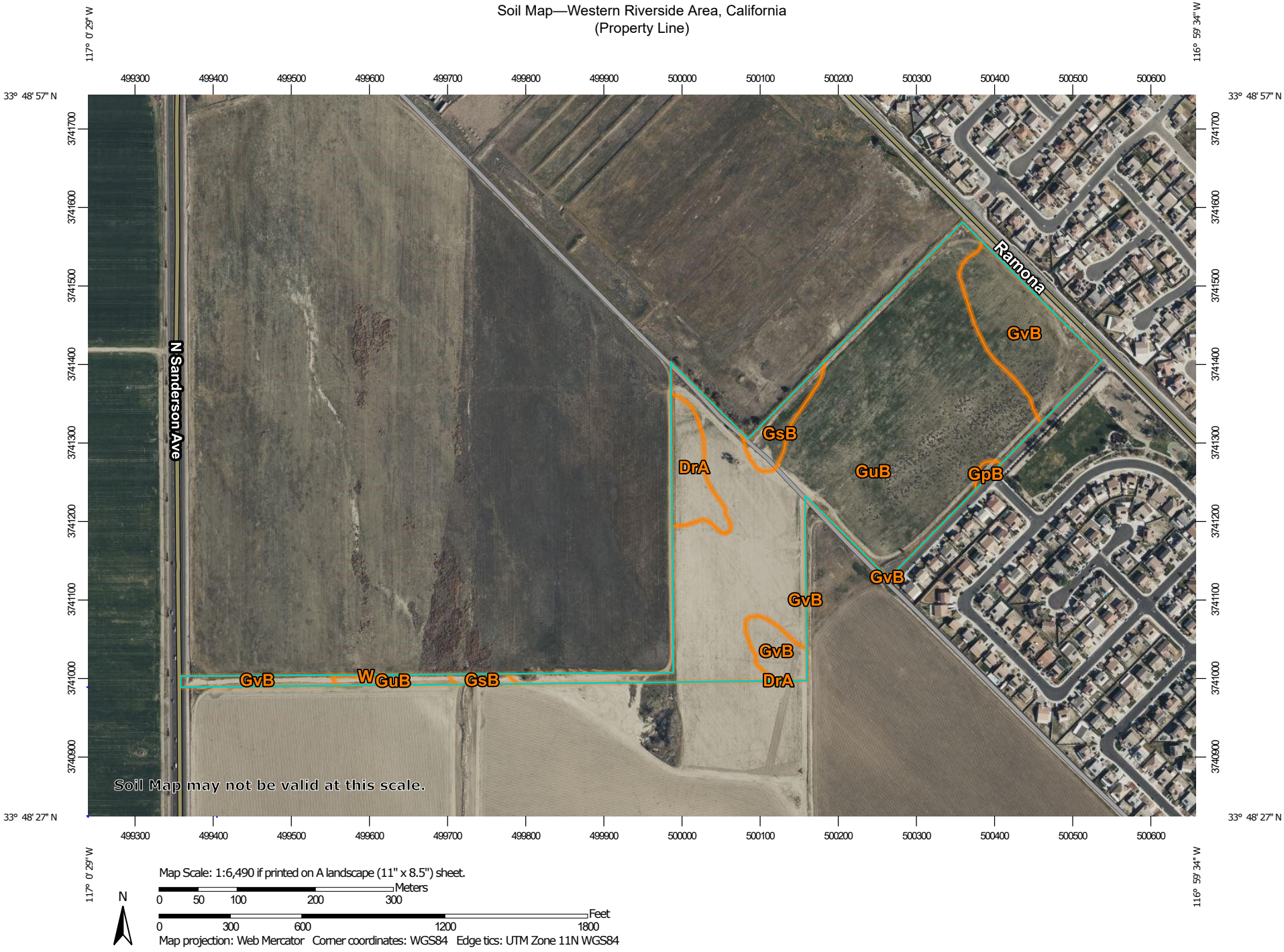


View of site access followed by disturbed areas consisting of dirt roads on site. View looking west

Hernandez Environmental Services

APPENDIX D

Soil Map—Western Riverside Area, California
(Property Line)



Map Scale: 1:6,490 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 15, Sep 6, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2022—May 28, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DrA	Dello loamy fine sand, gravelly substratum, 0 to 2 percent slopes	1.9	4.6%
GpB	Grangeville sandy loam, drained, saline-alkali, 0 to 5 percent slopes	0.1	0.3%
GsB	Grangeville sandy loam, sandy substratum, drained, saline-alkali , 0 to 5 percent slopes	1.3	3.3%
GuB	Grangeville fine sandy loam, poorly drained, saline-alk ali, 0 to 5 percent slopes	30.4	75.8%
GvB	Grangeville fine sandy loam, saline-alkali, 0 to 5 percent slopes	6.3	15.8%
W	Water	0.0	0.1%
Totals for Area of Interest		**40.0**	**100.0%**

APPENDIX E

Memorandum

Date: August 4, 2023

To: Hunsaker & Associates

From: Juan J. Hernandez, Principal Biologist

Subject: Focused Burrowing Owl Survey Report for Assessor's Parcel Numbers 436-030-001, 436-040-006, and 436-040-008 located in Riverside County, California.

This memorandum provides the methods and results of a Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) burrowing owl (*Athene cunicularia*) (BUOW) survey for Assessor's Parcel Numbers (APNs) 436-030-001, 436-040-006, and 436-040-008 located within the city of San Jacinto, Riverside County, California. The project proposes to construct a single-family residential development. The proposed residential development will consist of 184 residential lots and three open space lots. The proposed project includes associated parking, landscaping, access roads, and utilities (Figure 3). The proposed residential development will impact the entire 37.87-acre project site.

Project Location

The approximate 37.87-acre project site is located southwest of North Ramona Boulevard, East of North Sanderson Avenue and northwest of Ranch View Lane in the City of San Jacinto, County of Riverside, California. Specifically, the project site is located within San Jacinto Viejo land grant between the United States Geological Survey *San Jacinto* and *Lakeview* 7.5-Minute Quadrangles. The center point latitude and longitude coordinates for the project site are 33˚03'23.2332" North and 114˚56'42.7625" West (Figures 1 and 2, *Location Map* and *Vicinity Map*). Refer to Figures 1 and 2.

The study area included APNs 436-030-001, 436-040-006, 436-040-008, and a 150-meter (500-foot) buffer around the site, where accessible (Figure 4).

Project Contact Information

Owner/Applicant: Hunsaker & Associates
3 Hughes
Irvine, CA 92618

Principal Investigator: Juan J. Hernandez
Hernandez Environmental Services
17037 Lakeshore Drive
Lake Elsinore, CA 92530
(909) 772-9009

Field Survey Methods

HES implemented the three steps as described in the *Burrowing Owl Survey Instructions for the Western Riverside County Multiple Species Habitat Conservation Plan Area*. During the May 12, 2023 habitat assessment on site it was determined that the project site does not support burrowing habitat however there is suitable habitat within the 500-foot buffer. In accordance with the *Burrowing Owl Survey Instructions for the Western Riverside County Multiple Species Habitat Conservation Plan Area*, focused burrow and focused BUOW surveys (Part A and Part B, respectively) were conducted on four separate days during the breeding season: May 12, June 1, June 22, and June 29, 2023. Survey times, weather, and sunrise/sunset information is described in Table 1 below.

Table 1. Survey Information

Survey	Date	Survey Start Time	Sunrise/Sunset	Weather
1	May 12, 2023	0600 hours	0748 hours	50-55 degrees Fahrenheit, cloudy, winds 0-1 miles per hour to the south
2	June 1, 2023	0600 hours	0737 hours	53-56 degrees Fahrenheit, cloudy, winds 0-2 miles per hour to the northeast
3	June 22, 2023	0620 hours	0710 hours	53-54 degrees Fahrenheit, cloudy, winds 0-2 miles per hour to the northeast
4	June 29, 2023	O630 hours	0730 hours	56-58 degrees Fahrenheit, clear, winds 0-2 miles per hour to the northwest.

Surveys were conducted from one hour before sunrise to two hours after sunrise or two hours before sunset to one hour after sunset and during weather that was conducive to observing owls outside their burrows and detecting BUOW sign. The surveys were not conducted during rain, high winds (> 20 miles per hour), dense fog, or temperatures above 90 degrees Fahrenheit. Surveys involved walking through potentially suitable habitat within the survey area. The

pedestrian survey transects were spaced approximately 30 to 50 feet apart to allow 100 percent visual coverage of the ground surface. Special attention was paid to those habitat areas that appeared to provide suitable habitat for BUOW. Where permission to access the buffer areas could not be obtained, the biologist visually inspects adjacent habitats with binoculars.

All encountered burrows or structure entrances were checked for the presence of BUOW, molted feathers, cast pellets, prey remains, eggshell fragments, tracks, or excrement. Natural or man-made structures and debris piles that could support BUOW were also surveyed. The locations of all suitable BUOW habitat, potential burrows, BUOW sign, and any BUOW observed was recorded and mapped with a handheld Global Positioning System (GPS) unit.

All wildlife species encountered visually or audibly during the field survey were identified and recorded in field notes. Binoculars were used to aid in the identification of observed wildlife. Photographs were taken to document existing conditions within the survey area.

Results

The project site contains three different habitat types: agricultural, disturbed, and developed. Soils at the project site are classified as Dello loamy fine sand (DrA), 0 to 2 percent slopes, gravelly substratum Grangeville sandy loam (GpB), 0 to 5 percent slopes, drained, saline-alkali, Grangeville sandy loam (GsB), 0 to 5 percent slopes, poorly drained, saline-alk ali, Grangeville fine sandy loam (GvB), 0 to 5 percent slopes, saline-alkali, and Water (W). The project site is flat with elevation ranges from 1,469 feet above mean sea-level (AMSL) to 1,482 AMSL. The site is disturbed, and continually disturbed for agricultural purposes. The dominant species on site are tumbleweed (*Salsola tragus*), prickly lettuce (*Lactuca serriola*), and stinknet (*Oncosiphon piluliferum*).

The habitat assessment conducted on May 12, 2023 found that the project site does provide suitable burrows/nesting opportunities for BUOW. Evidence of ground squirrels and ground squirrel activities was observed, and approximately 23 suitable burrows were identified and recorded on the project site and 6 burrows off site. BUOW signs such as molted feathers, cast pellets, and excrement found on rock outcroppings were not found. No BUOW were observed on the project site.

Based on the absence of BUOW and BUOW evidence (i.e., scat, pellets, and feathers) within the study area, it can be concluded that the study area is not in use by BUOW.

Recommendations

It is recommended that the following measures be implemented to ensure that potential impacts to BUOW are less than significant:

- Conduct a presence/absence survey within 120 days prior to ground disturbance to determine if relocation is necessary.
- According to the MSHCP, if BUOW are detected on the project site then the action(s) taken will be as follows:
    - If the site is within the Criteria Area, then at least 90 percent of the area with long-term conservation value will be included in the MSHCP Conservation Area.
    - Otherwise:
        1. If the site contains, or is part of an area supporting less than 35 acres of suitable habitat or the survey reveals that the site and the surrounding area supports fewer than 3 pairs of BUOWs, then the on-site BUOWs will be passively or actively relocated following accepted protocols.
        2. If the site (including adjacent areas) supports three or more pairs of BUOWs, supports greater than 35 acres of suitable habitat and is non-contiguous with MSHCP Conservation Area lands, at least 90 percent of the area with long-term conservation value and BUOW pairs will be conserved onsite.
    - If the 37.87-acre project site is found to support BUOWs, a Determination of Biologically Equivalent or Superior Preservation (DBESP) Report and Burrowing Owl Relocation Plan will need to be prepared in coordination with the RCA and resource agencies.
        - The DBESP and Burrowing Owl Relocation Plan will include the following:
            - Location that BUOWs are being removed from;
            - Number of BUOWs being relocated, including number of pairs and number of singles;
            - Description of methods that will be used to ensure that onsite burrows are vacant prior to their collapse;
            - Location and landowner contact information for the release site;
            - Description of the release site, including habitat description, presence/absence of ground squirrels, presence/absence of other BUOWs, results of predator survey, results of prey survey, and plans to maintain artificial burrow systems and manage the land for BUOWs long-term.
- If the presence/absence survey finds that BUOW no longer occupy the study area, conduct an MSHCP preconstruction survey within 30 days prior to the start of any ground disturbing activities a 30-day preconstruction survey is required prior to the commencement of project activities (e.g. vegetation clearing, clearing and grubbing, tree removal, site watering) to ensure that no owls have colonized the site in the days or weeks preceding project activities.

Certification

I hereby certify that the statements furnished above and in the attached exhibits present data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: August 4, 2023



Juan J. Hernandez
Principal Biologist

Enclosures:

Figure 1: Project Location Map
Figure 2: Project Vicinity Map
Figure 3: Project Plans
Figure 4: Survey Area Map
Figure 5: Results Map
Appendix A: Site Photographs

FIGURE 1

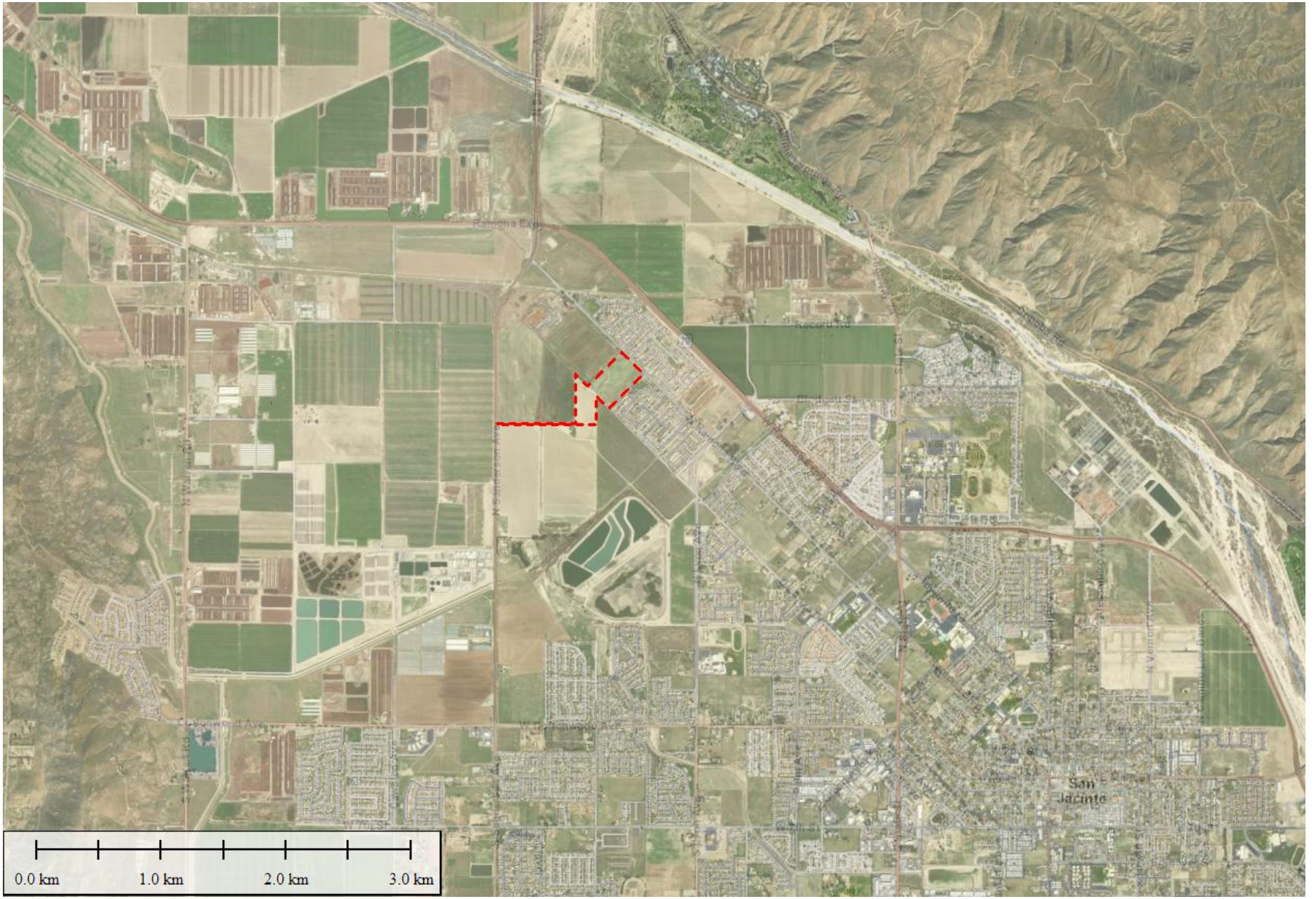


Figure 1
Location Map
TTM 38066
San Jacinto
Riverside County, California

Legend

Project Site

N

Hernandez Environmental Services

FIGURE 2

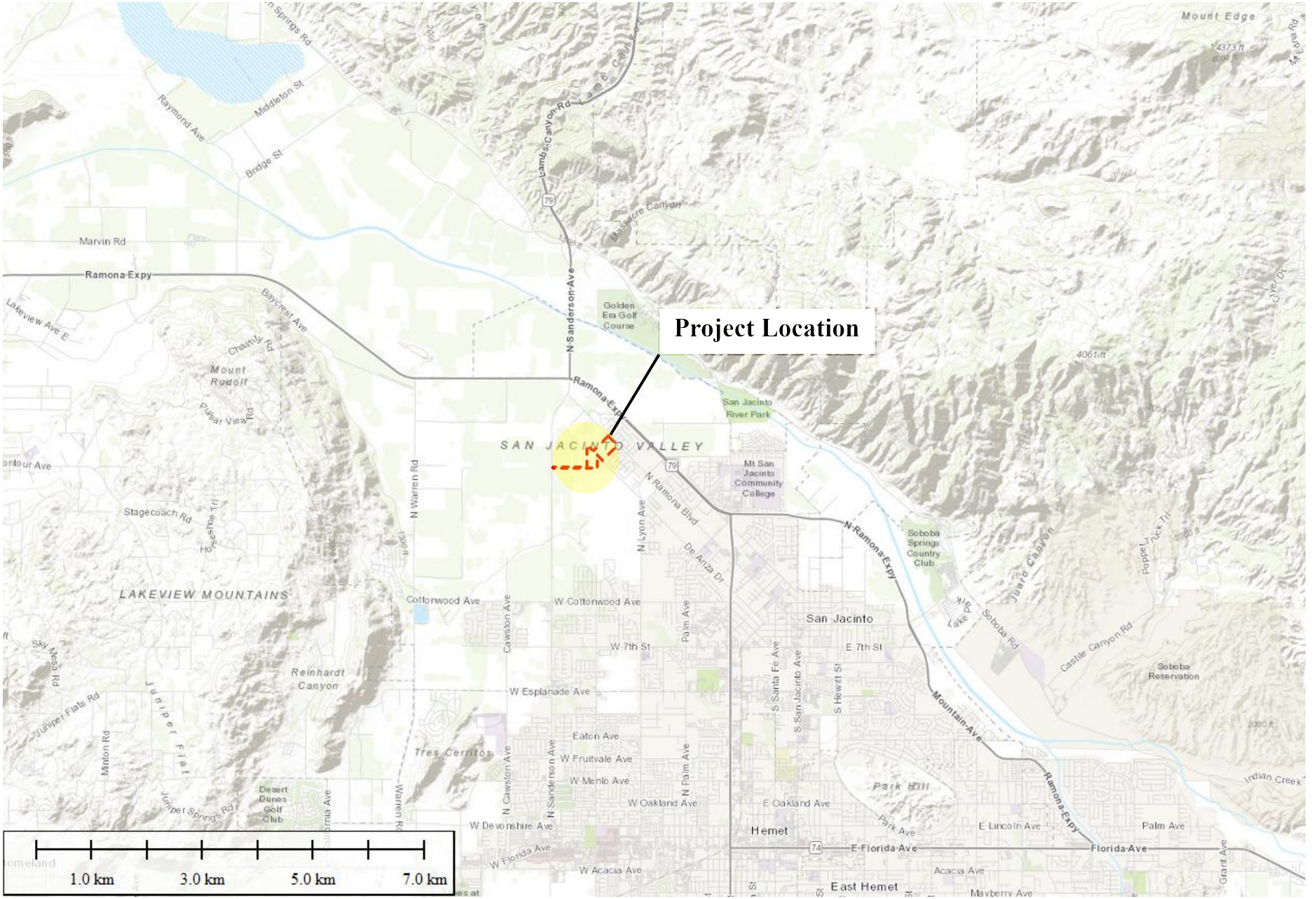


Figure 2
Vicinity Map
TTM 38066
San Jacinto
Riverside County, California

Legend

Project Site

N

Hernandez Environmental Services

FIGURE 3

CITY OF SAN JACINTO
TENTATIVE TRACT MAP 38066

SHEET INDEX

TENTATIVE TRACT MAP	1 & 2
CONCEPTUAL GRADING DRAINAGE PLAN	3
CONCEPTUAL UTILITY PLAN	4
CONCEPTUAL SIGNING & STRIPING PLAN ALONG RAMONA BLVD	5
PRELIMINARY WQMP SITE PLAN	6

LEGAL DESCRIPTION:

THE LAND REFERRED TO HEREI BELOW IS SITUATED IN THE CITY OF SAN JACINTO, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL ONE:

THAT PORTION OF FARM LOT 129 OF LAND OF SAN JACINTO LAND ASSOCIATION IN THE CITY OF SAN JACINTO, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 8, PAGE 357 OF MAPS, RECORDS OF SAN DIEGO COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEASTERLY CORNER OF SAID LOT 129 WHICH CORNER IS ALSO THE NORTHEASTERLY CORNER OF FARM LOT 133 OF SAID LANDS OF SAN JACINTO LAND ASSOCIATION AS SHOWN BY MAP ON FILE IN BOOK 8, PAGE 357 OF MAPS, RECORDS OF SAN DIEGO COUNTY, CALIFORNIA; THENCE WESTERLY ALONG THE NORTHERLY LINE OF SAID LOT 133, A DISTANCE OF 561.00 FEET; THENCE NORTHERLY AND PARALLEL TO THE EASTERLY LINE OF SAID LOT 129, A DISTANCE OF 1,325.00 FEET, MORE OR LESS, TO THE NORTHEASTERLY LINE OF SAID LOT 129; THENCE SOUTHEASTERLY ALONG THE NORTHEASTERLY LINE OF SAID LOT 129, A DISTANCE OF 740.00 FEET, MORE OR LESS, TO THE MOST NORTHERLY CORNER OF FARM LOT 130 OF LANDS OF SAN JACINTO LAND ASSOCIATION AS SHOWN BY MAP ON FILE IN BOOK 8, PAGE 357 OF MAPS, RECORDS OF SAN DIEGO COUNTY CALIFORNIA; THENCE SOUTHERLY ALONG THE EASTERLY LINE OF SAID LOT 129, A DISTANCE OF 750.00 FEET, MORE OR LESS, TO THE TRUE POINT OF BEGINNING.

APN PORTION OF 439-030-001

PARCEL THREE:

THE SOUTHEASTERLY HALF OF FARM LOT 7 OF LANDS OF SAN JACINTO LAND ASSOCIATION, IN THE CITY OF SAN JACINTO, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 8, PAGE 357 OF MAPS, RECORDS OF SAN DIEGO COUNTY.
APN: 436-040-006

PARCEL FOUR:

THE NORTHWESTERLY QUARTER OF FARM LOT 9 OF LANDS OF SAN JACINTO LAND ASSOCIATION, IN THE CITY OF SAN JACINTO, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 8, PAGE 357 OF MAPS, RECORD OF OF SAN DIEGO COUNTY.
APN: 436-040-008

TITLE EXCEPTION AND EASEMENTS:

PER TITLE REPORT BY FIDELITY NATIONAL TITLE COMPANY DATED ON JANUARY 14, 2019
ORDER NUMBER: 00214622-994VNO-CH

- *AN EASEMENT IN FAVOR OF THE PUBLIC FOR ROAD PURPOSES (DE ANZA DRIVE) PER MAP OF THE "LANDS OF SAN JACINTO LAND ASSOCIATION", M.B. 8/357 SAN DIEGO COUNTY.*

(4) *RIGHTS OF THE PUBLIC IN AND TO ANY PORTION OF THE PROPERTY HEREIN DESCRIBED LYING WITHIN DE ANZA DRIVE. A PORTION OF WHICH WAS ACCEPTED IN A RESOLUTION EXECUTED BY THE BOARD OF SUPERVISORS FOR THE COUNTY OF RIVERSIDE*

RECORDING DATE: JANUARY 27, 1953
RECORDING NO,: BOOK 1435, PAGE 487, OFFICIAL RECORS

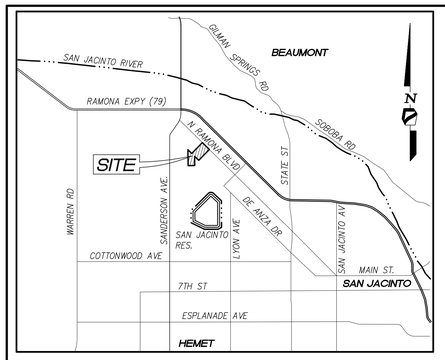
BENCHMARK:

RIVERSIDE COUNTY BENCH MARK
H-48, AUGUST 1985
ELEV. = 1464.075

0.3 MILE SE'LY ALONG RAMONA BLVD., FROM THE INTERSECTION OF SANDERSON AVE AND RAMONA BLVD., 1 FT. ± N'LY OF THE S'LY END OF A 5FT LONG X 2 FT HIGH CONCRETE HEADWALL; 44 FT ± ELY OF THE NE'LY CORNER OF A CONCRETE DRIVEWAY AT 37835 RAMONA BLVD., SET A STD. 3" DIA. ALUM. DISK, STAMPED AS ABOVE, IN THE TOP OF HEADWALL.

FLOODZONE:

ACCORDING TO THE COUNTY OF MORENO VALLEY BLVD AND BASED UPON THE NATIONAL INSURANCE PROGRAM MAPS THIS SITE LIES WITHIN FLOOD ZONE A SHADED, COMMUNITY PANEL NO. 06065C1490H DATED APRIL 19, 2017 AND 06065C1470H, AUGUST 28, 2008 AND 06065C1480H, AUGUST 287, 2008 PUBLISHED BY THE FEDERAL INSURANCE ADMINISTRATION.



VICINITY MAP
N.T.S.



GENERAL NOTES:

PROJECT LOCATION:	SW SIDE OF RAMONA BLVD BETWEEN SHIMMERING WAY AND RANCH VIEW LANE, SAN JACINTO, CA 92582
ASSESSOR PARCEL NUMBER:	436-030-001, 436-040-006 & 436-040-008
EXISTING AND PROPOSED ZONING DESIGNATION:	RM / RL
PLAN DESIGNATION:	RM / RL
SUBDIVISION ACREAGE:	37.87 ACRE
DATE MAP PREPARED:	OCTOBER, 2022
NUMBERED LOTS / DWELLING UNITS:	184 LOTS
MIN, LOT SIZE:	4,800 SF
NUMBER OF OPEN SPACE LOTS:	3 LOTS

LEGEND:

- PROJECT BOUNDARY LINE
- LOT LINE
- CENTER LINE
- R/W
- EASEMENTS
- STORM DRAIN
- -S- SEWER LINE
- -W- WATER LINE
- RETAINING WALL

PHASE #	TOTAL
1	35 LOTS
2	70 LOTS
3	53 LOTS
4	48 LOTS
TOTAL	206 LOTS

UTILITY PURVEYORS

WATER & SEWER:
EASTERN MUNICIPAL WATER DISTRICT
2270 TRUMBLE ROAD, PERRIS, CALIFORNIA 92572
PH: (951) 928-3777

ALEX SALAZAR
PH: (909)335-7602
ASALAZAR@SOCALGAS.COM

CABLE / CHARTER:
JOSH VOLLMER
PH: (858) 652-8236
JOSHUA.VOLLMER@CHARTER.COM

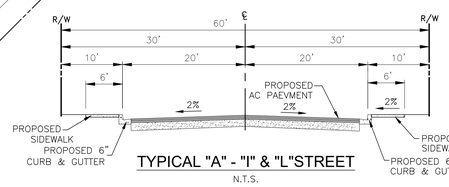
TELEPHONE/FRONTIER
REBECCA SMITH
PH: (909) 748-6643
REBECCA.SMITH1@FTR.COM

SCE
LETICIA MENDOZA
PH: (951) 212-2366
LETICIA.MENDOZA@SCE.COM

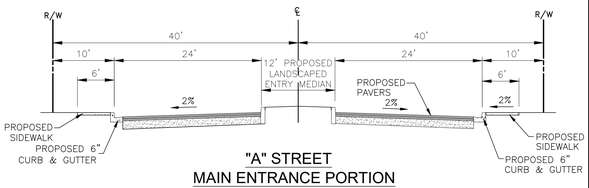
SCHOOL DISTRICT:
SAN JACINTO UNIFIED SCHOOL DISTRICT
20455 SOUTH SAN JACINTO AVENUE
SAN JACINTO, CA 92583
PH: (800) 892-2253

OWNER/DEVELOPER:

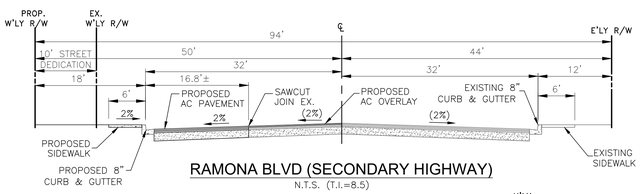
CAMELLIA HOMES
8201 GRAND DRIVE
HUNTINGTON BEACH, CA 92646
PHONE: (858) 997-7973



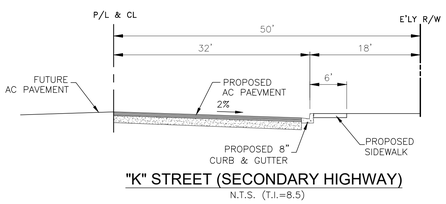
TYPICAL "A" - "I" & "L"STREET
N.T.S.



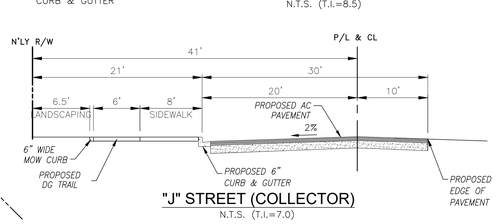
"A" STREET
MAIN ENTRANCE PORTION
N.T.S.



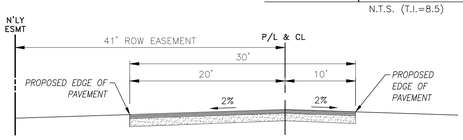
RAMONA BLVD (SECONDARY HIGHWAY)
N.T.S. (T.I.=8.5)



"K" STREET (SECONDARY HIGHWAY)
N.T.S. (T.I.=8.5)



"J" STREET (COLLECTOR)
N.T.S. (T.I.=7.0)



"J" STREET TO SANDERSON AVE
N.T.S.

MATCH LINE - SEE SHEET 2

REVISION			
DESCRIPTION	REC.	APPR.	DATE

REGISTERED PROFESSIONAL ENGINEER — TIN N. HUYNH — NO. 69273 Exp. 06/30/24 — CIVIL — STATE OF CALIFORNIA

HUNSAKER & ASSOCIATES
IRVINE INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
Three Hughes Irvine, CA 92618 ▪ PH: (949) 583-1010 ▪ FX: (949) 583-0759

PREPARED UNDER THE SUPERVISION OF:

TIN N. HUYNH R.C.E. NO. 69273 DATE

CITY OF SAN JACINTO
CALIFORNIA

VALLE RESEDA
TENTATIVE TRACT MAP
N. RAMONA BLVD SAN JANCINTO, CA 92582

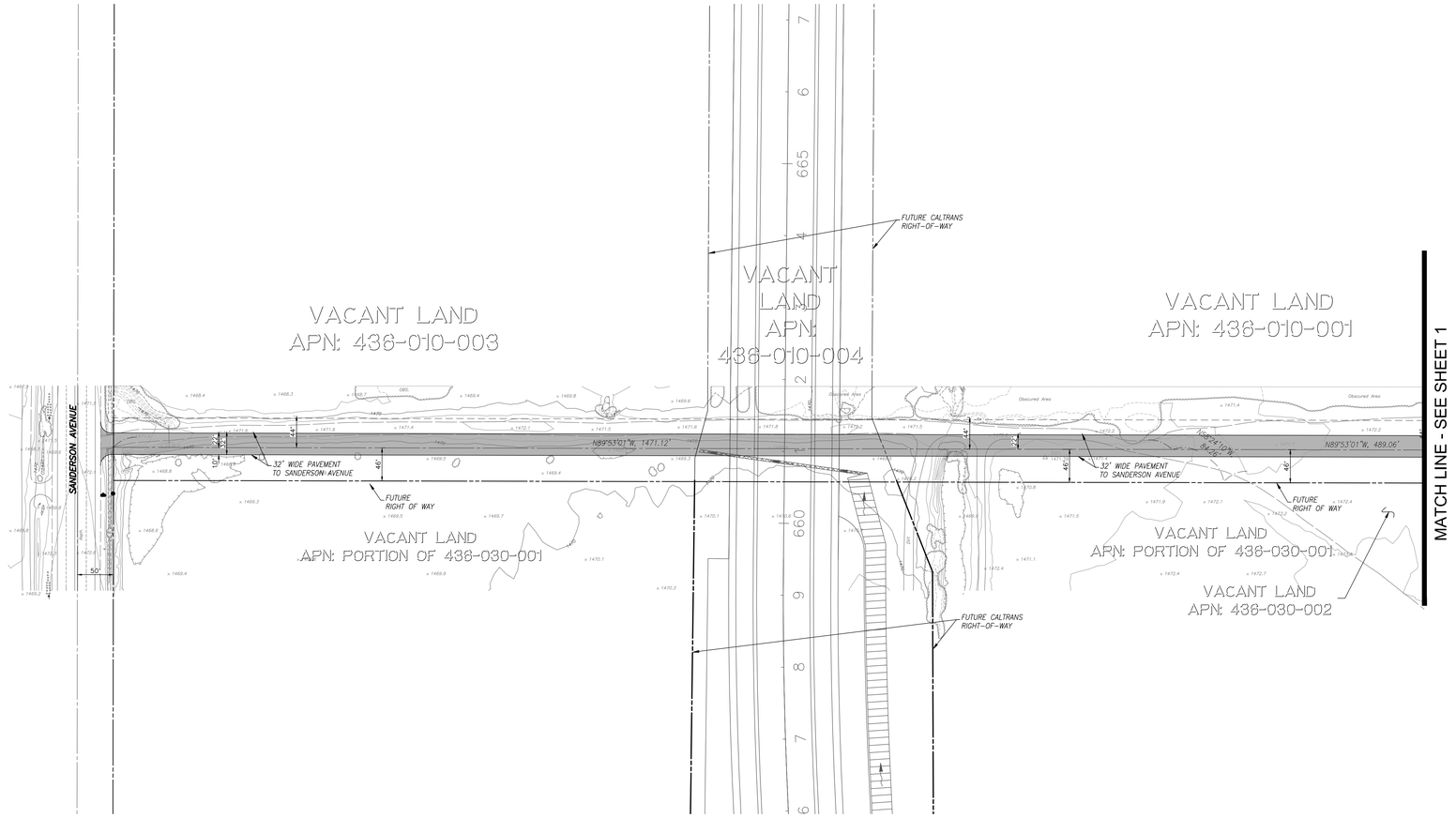
SCALE: AS SHOWN

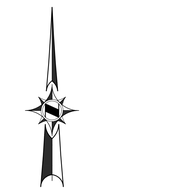
DRAWING NO. | PROJECT NO. | SHEET 1 OF 6 SHEETS

W.O. 4513-1 TRACT NO. 38066 TENTATIVE TRACT MAP

PLOTTED BY: Sophie Pham DATE: Apr. 26, 2023 11:51:53 AM FILE: F:\1244\Planning\SA_Site\Exh_TTM\SHT01.dwg

CITY OF SAN JACINTO
TENTATIVE TRACT MAP 38066



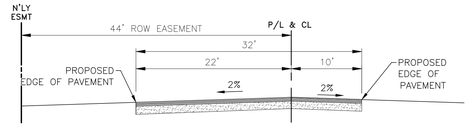


0 40 80 160 240 320

SCALE: 1" = 80'

LEGEND:

- PROJECT BOUNDARY LINE
- LOT LINE
- CENTER LINE
- R/W
- EASEMENTS
- STORM DRAIN
- SEWER LINE
- WATER LINE
- PROPSOED AC PAVEMENT



"J" STREET TO SANDERSON AVE

N.T.S.

LOT AREA TABLE

TTM TRACT 38066
LOT AREA TABLE

Lot No.	Lot Area (SF)	Lot No.	Lot Area (SF)	Lot No.	Lot Area (SF)	Lot No.	Lot Area (SF)	Lot No.	Lot Area (SF)
1	5,345	51	5,973	101	4,601	151	4,650	201	4,501
2	**5,300**	**52**	**5,504**	**102**	**4,601**	**152**	**5,488**	**202**	**4,420**
3	5,300	53	5,170	103	4,601	153	4,535	203	4,420
4	**5,300**	**54**	**5,170**	**104**	**4,601**	**154**	**4,600**	**204**	**4,420**
5	5,300	55	5,115	105	4,601	155	4,471	205	4,420
6	**5,300**	**56**	**4,607**	**106**	**4,601**	**156**	**3,916**	**206**	**4,895**
7	5,300	57	4,404	107	4,601	157	3,849	**LOT "A"**	**18,450**
8	**5,300**	**58**	**6,567**	**108**	**4,601**	**158**	**6,093**	**LOT "B"**	**99,730**
9	5,300	59	6,663	109	4,601	159	6,735	LOT "C"	15,250
10	**5,200**	**60**	**4,404**	**110**	**4,592**	**160**	**3,554**		
11	6,200	61	4,607	111	4,450	161	3,852		
12	**5,200**	**62**	**5,115**	**112**	**4,605**	**162**	**4,359**		
13	5,200	63	5,170	113	5,234	163	4,425		
14	**5,200**	**64**	**5,170**	**114**	**4,650**	**164**	**4,503**		
15	5,200	65	5,507	115	4,650	165	4,511		
16	**5,200**	**66**	**5,504**	**116**	**4,650**	**166**	**4,431**		
17	5,200	67	5,170	117	4,650	167	4,365		
18	**5,200**	**68**	**5,170**	**118**	**4,650**	**168**	**3,859**		
19	5,200	69	5,116	119	4,650	169	3,557		
20	**5,005**	**70**	**4,609**	**120**	**4,650**	**170**	**6,731**		
21	5,406	71	4,402	121	4,650	171	6,742		
22	**7,558**	**72**	**6,661**	**122**	**4,650**	**172**	**3,556**		
23	5,001	73	7,740	123	4,650	173	3,854		
24	**5,839**	**74**	**5,412**	**124**	**4,650**	**174**	**4,361**		
25	4,601	75	5,367	125	4,650	175	4,427		
26	**4,600**	**76**	**5,369**	**126**	**4,650**	**176**	**4,507**		
27	4,600	77	5,170	127	4,650	177	4,505		
28	**4,600**	**78**	**5,170**	**128**	**4,650**	**178**	**4,425**		
29	4,600	79	5,499	129	4,650	179	4,356		
30	**4,600**	**80**	**7,039**	**130**	**4,650**	**180**	**3,847**		
31	4,600	81	7,092	131	4,650	181	3,555		
32	**4,600**	**82**	**6,930**	**132**	**5,560**	**182**	**6,545**		
33	4,599	83	5,786	133	5,550	183	6,960		
34	**4,689**	**84**	**8,197**	**134**	**4,650**	**184**	**3,561**		
35	6,535	85	7,364	135	4,650	185	3,847		
36	**6,186**	**86**	**4,953**	**136**	**4,650**	**186**	**4,358**		
37	7,419	87	5,945	137	4,650	187	4,427		
38	**6,875**	**88**	**4,600**	**138**	**4,650**	**188**	**4,507**		
39	6,251	89	4,600	139	4,650	189	4,501		
40	**5,617**	**90**	**4,600**	**140**	**4,650**	**190**	**4,419**		
41	5,520	91	4,600	141	4,650	191	4,348		
42	**5,520**	**92**	**4,600**	**142**	**4,650**	**192**	**3,835**		
43	5,520	93	4,600	143	4,650	193	3,554		
44	**5,520**	**94**	**4,600**	**144**	**4,650**	**194**	**6,761**		
45	5,520	95	4,600	145	4,650	195	6,672		
46	**5,520**	**96**	**4,600**	**146**	**4,650**	**196**	**3,570**		
47	5,520	97	4,600	147	4,650	197	3,846		
48	**5,520**	**98**	**4,600**	**148**	**4,650**	**198**	**4,360**		
49	5,520	99	4,601	149	4,650	199	4,432		
50	**5,520**	**100**	**4,601**	**150**	**4,650**	**200**	**4,511**		

REVISION

	DESCRIPTION	REC.	APPR.	DATE

REGISTERED PROFESSIONAL ENGINEER
TIN N. HUYNH
NO. 69273
Exp. 06/30/24
CIVIL
STATE OF CALIFORNIA

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PREPARED UNDER THE SUPERVISION OF:

TIN N. HUYNH R.C.E. NO. 69273 DATE

CITY OF SAN JACINTO
CALIFORNIA

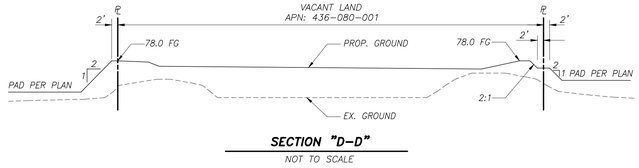
VALLE RESEDA
TENTATIVE TRACT MAP
N. RAMONA BLVD SAN JANCINTO, CA 92582

DRAWING NO. | PROJECT NO. | SCALE: AS SHOWN | SHEET 2 OF 6 SHEETS

W.O. 4513-1 TRACT NO. 38066 TENTATIVE TRACT MAP

PLOTTED BY: Sophie Pham DATE: Apr. 26, 2023 11:49:46 AM FILE: F:\1244\Planning\SA_Site\Exh_TTM\SHT02.dwg

CITY OF SAN JACINTO
CONCEPTUAL GRADING DRAINAGE PLAN



SECTION "D–D"
NOT TO SCALE

EARTHWORK QUANTITIES	
RAW CUT	70,230 CU. YDS.
RAW FILL	70,230 CU. YDS.
NET EXPORT	0 CU. YDS.

PHASE #	TOTAL
1	35 LOTS
2	70 LOTS
3	53 LOTS
4	48 LOTS
TOTAL	206 LOTS

LEGEND:

- PROJECT BOUNDARY LINE
- LOT LINE
- CENTER LINE
- R/W
- EASEMENTS
- STORM DRAIN
- -S- SEWER LINE
- -W- WATER LINE
- EDF EDGE OF DEEPENED FOOTING
- BTM BOTTOM
- C/F CUT FILL TRANSITION LINE
- PROPOSED DRAINAGE PATTERN
- EXISTING DRAINAGE PATTERN
- PROPOSED AC PAVEMENT

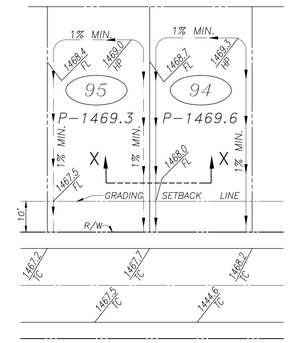
TC	TOP OF CURB
FL	FLOWLINE
BW	BACK OF WALK
HP	HIGH POINT
P	PAD ELEVATION
FF	FINISH FLOOR
FS	FINISH SURFACE
GB	GRADE BREAK
BSL	BUILDING SETBACK LINE
FG	FINISH GROUND
NG	NATURAL GROUND
TF	TOP OF BLOCK WALL FOOTING
TG	TOP OF GRATE
S	SEWER
W	WATER
INV	INVERT

TITLE EXCEPTIONS AND EASEMENTS

PER TITLE REPORT BY FIDELITY NATIONAL TITLE COMPANY DATED ON JANUARY 14, 2019, ORDER NUMBER: 00214622–994–VNO–CH

(4) RIGHTS OF THE PUBLIC IN AND TO ANY PORTION OF THE PROPERTY HEREIN DESCRIBED LYING WITHIN DE ANZA DRIVE. A PORTION OF WHICH WAS ACCEPTED IN A RESOLUTION EXECUTED BY THE BOARD OF SUPERVISORS FOR THE COUNTY OF RIVERSIDE

RECORDING DATE: JANUARY 27, 1953
RECORDING NO.: BOOK 1435, PAGE 487, OFFICIAL RECORDS



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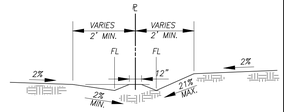

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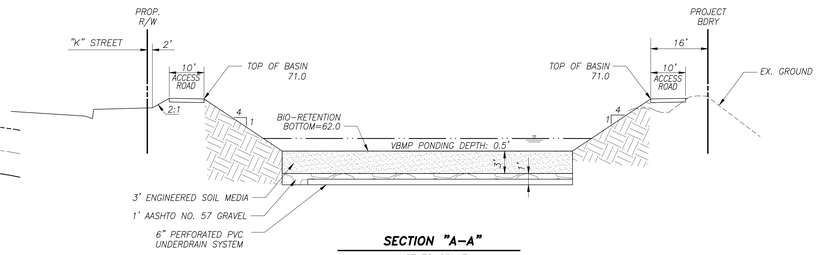

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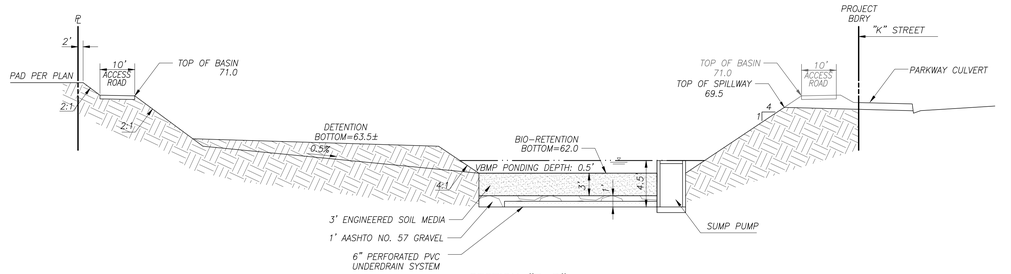

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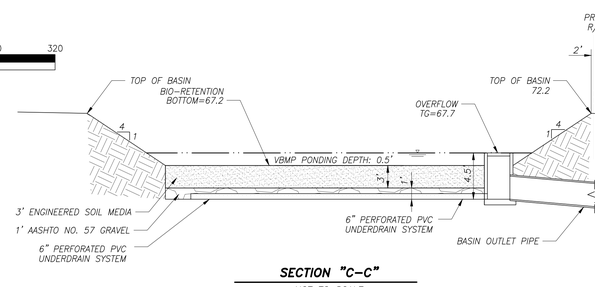

SECTION "C–C"
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REVISION			
DESCRIPTION	REC.	APPR.	DATE

REGISTERED PROFESSIONAL ENGINEER TIN N. HUYNH NO. 69273 Exp. 06/30/24 CIVIL STATE OF CALIFORNIA

HUNSAKER & ASSOCIATES
IRVINE INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
Three Hughes Irvine, CA 92618 ▪ PH: (949) 583-1010 ▪ FX: (949) 583-0759

PREPARED UNDER THE SUPERVISION OF:

TIN N. HUYNH R.C.E. NO. 69273 DATE

CITY OF SAN JACINTO CALIFORNIA

VALLE RESEDA
CONCEPTUAL GRADING DRAINAGE PLAN
N. RAMONA BLVD SAN JANCINTO, CA 92582

SCALE: AS SHOWN

DRAWING NO. | PROJECT NO. | SHEET 3 OF 6 SHEETS

W.O. 4513-1 TRACT NO. 38066 TENTATIVE TRACT MAP

PLOTTED BY: Sophie Pham DATE: Apr. 26, 2023 11:52:15 AM FILE: F:\1244\Planning\SA_Site\Exh_TTM\SHT03.dwg

CITY OF SAN JACINTO
CONCEPTUAL UTILITY PLAN

0 40 80 160 240 320
SCALE: 1" = 80'

LEGEND:

- PROJECT BOUNDARY LINE
- LOT LINE
- CENTER LINE
- R/W
- EASEMENTS
- STORM DRAIN
- SEWER LINE
- WATER LINE
- PROPOSED SEWER LINE
- PROPOSED WATER LINE
- EXISTING FIRE HYDRANT
- WV — WATER VALVE
- PP — POWER POLE
- WM — WATER METER
- PB — PULL-BOX
- CO — SEWER CLEAN-OUT
- EXISTING STREET SIGNAL
- PARKING LIGHT
- IRR. WM — IRRIGATION WATER METER
- DDC — DOUBLE DETECTOR CHECK VAVLE
- SMH — SEWER MANHOLE
- CB — CATCH BASIN
- FDC — FIRE DETECTOR CHECK VAVLE

TITLE EXCEPTIONS AND EASEMENTS

PER TITLE REPORT BY FIDELITY NATIONAL TITLE COMPANY DATED ON JANUARY 14, 2019, ORDER NUMBER: 00214622-994-VNO-CH

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RECORDING DATE: JANUARY 27, 1953
RECORDING NO.: BOOK 1435, PAGE 487, OFFICIAL RECORDS

UTILITY & SERVICE AGENCIES:

ELECTRIC:	SOUTHERN CALIFORNIA EDISON PH: (800) 655-4555
GAS:	THE GAS COMPANY 527 N. SAN JACINTO AVE, HEMET, CA 92583 PH: 1-800-427-2200
WATER & SEWER:	EASTERN MUNICIPAL/WATER DISTRICT 2270 TRUMBLE ROAD (951) 928-3777
CABLE/BROADBAND:	TIME WARNER PH: 1-800-892-2253
TELEPHONE/FIOS TV /BROADBAND:	VERIZON CALIFORNIA PH: 1-800-483-4000
SCHOOL DISTRICT	SAN JACINTO UNIFIED SCHOOL DISTRICT 2045 S. SAN JACINTO AVENUE, SAN JACINTO, CA 92583 PH: 1-800-892-2253

PHASE #	TOTAL
1	35 LOTS
2	70 LOTS
3	53 LOTS
4	48 LOTS
TOTAL	206 LOTS

REVISION

DESCRIPTION	REC.	APPR.	DATE

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TIN N. HUYNH R.C.E. NO. 69273 DATE

CITY OF SAN JACINTO
CALIFORNIA
VALLE RESEDA
CONCEPTUAL UTILITY PLAN
N. RAMONA BLVD SAN JANCINTO, CA 92582

DRAWING NO. | PROJECT NO. | SCALE: AS SHOWN | SHEET 4 OF 6 SHEETS

W.O. 4513-1 TRACT NO. 38066 TENTATIVE TRACT MAP

PLOTTED BY: Sophie Pham DATE: Apr. 26, 2023 11:54:04 AM FILE: F:\1244\Planning\SA_Site\Exh_TTM\SHT04.dwg

CITY OF SAN JACINTO, COUNTY OF RIVERSIDE

CONCEPTUAL SIGNING & STRIPING PLAN

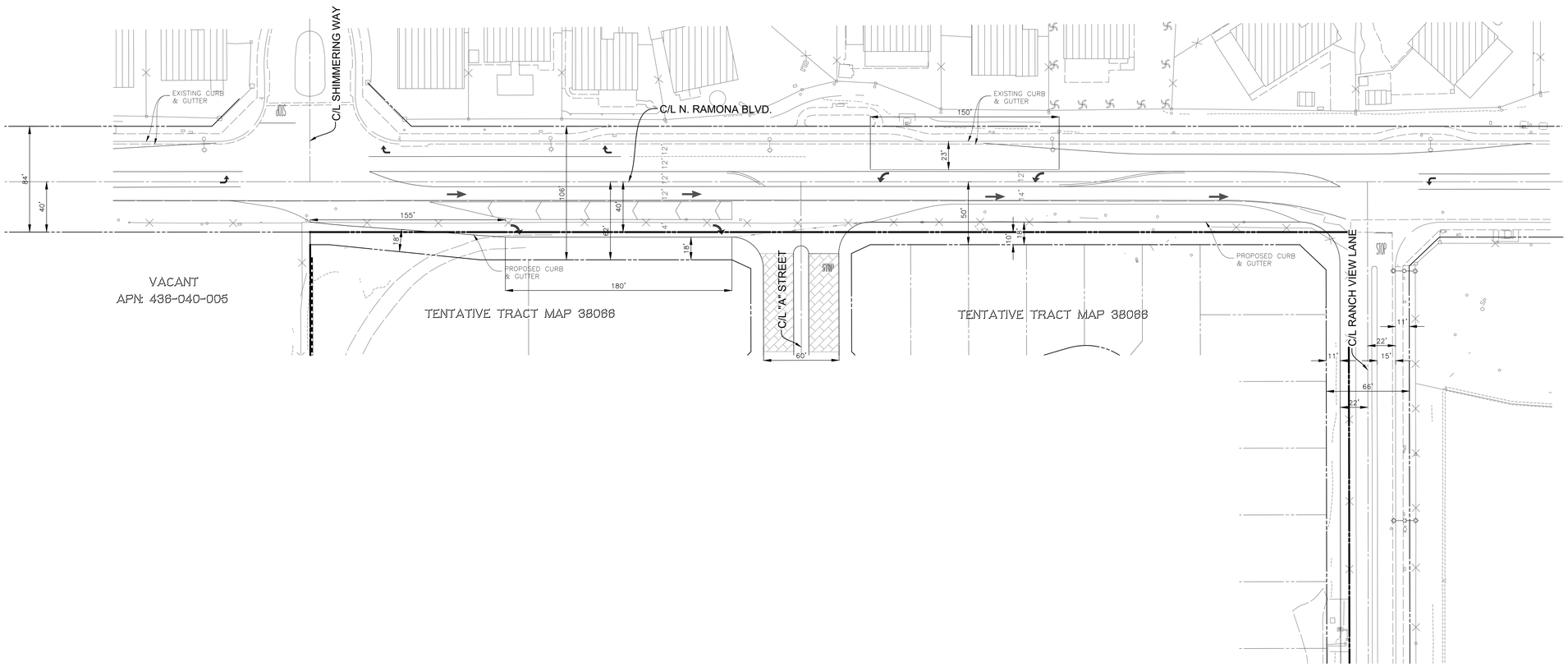
RAMONA BLVD., TTM 38066

0 20 40 80 120 160

SCALE: 1" = 40'

LEGEND:

- PROJECT BOUNDARY LINE
- LOT LINE
- CENTER LINE
- R/W
- EASEMENTS



REVISION					
			DESCRIPTION	REC.	APPR.	DATE

REGISTERED PROFESSIONAL ENGINEER TIN N. HUYNH NO. 69273 Exp. 06/30/24 CIVIL STATE OF CALIFORNIA

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PREPARED UNDER THE SUPERVISION OF:

TIN N. HUYNH R.C.E. NO. 69273 DATE

CITY OF SAN JACINTO
CALIFORNIA

VALLE RESEDA
CONCEPTUAL SIGNING & STRIPING PLAN
N. RAMONA BLVD SAN JANCINTO, CA 92582

SCALE: AS SHOWN

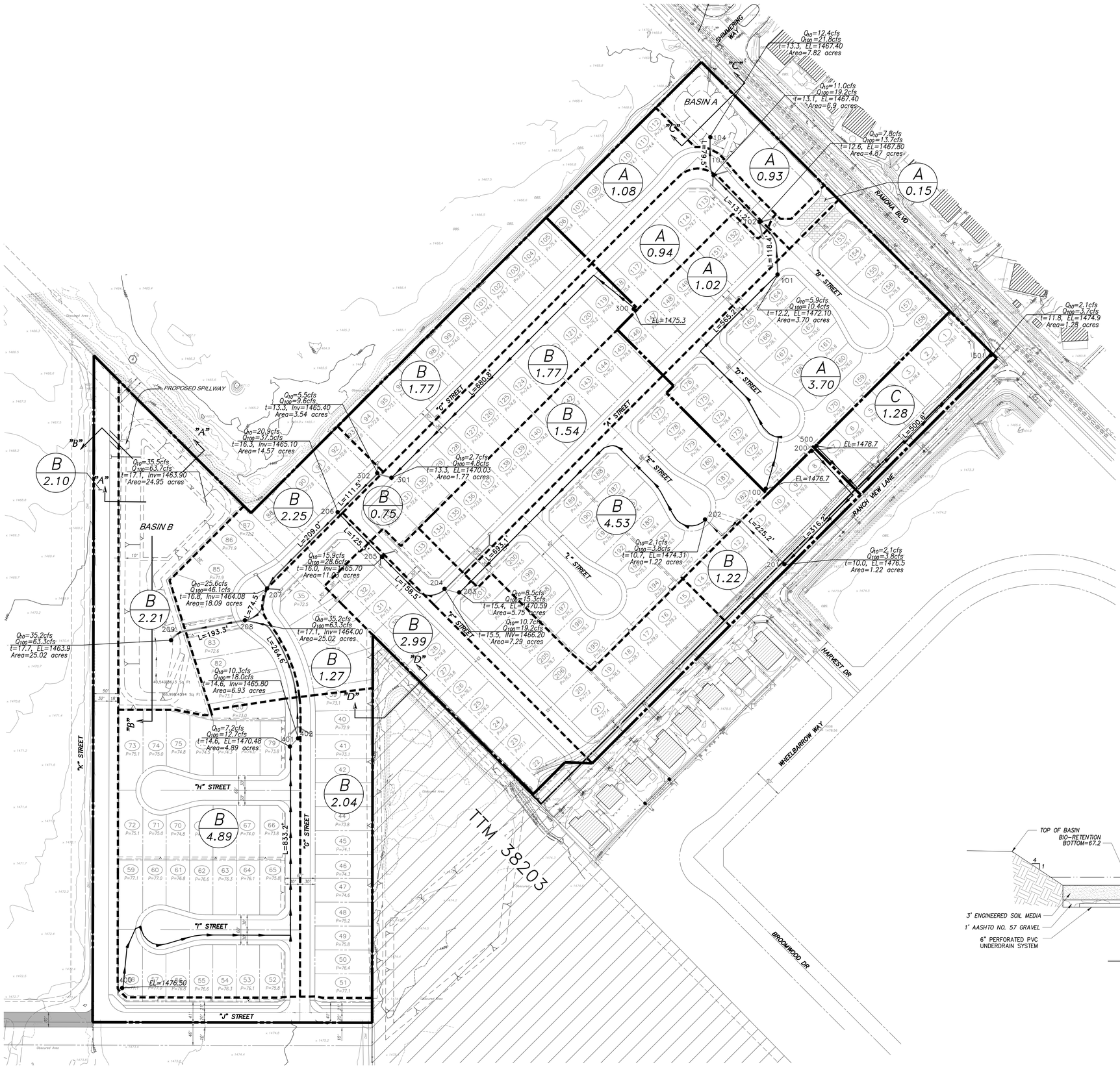
DRAWING NO. | PROJECT NO. | SHEET 5 OF 6 SHEETS

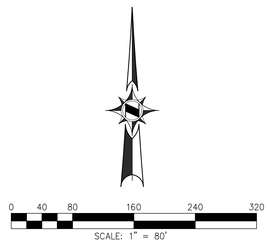
W.O. 4513-1 TRACT NO. 38066 TENTATIVE TRACT MAP

PLOTTED BY: Sophie Pham DATE: Apr. 26, 2023 11:56:09 AM FILE: F:\1244\Planning\SA_Site\Exh_TTM\SHT05.dwg

CITY OF SAN JACINTO

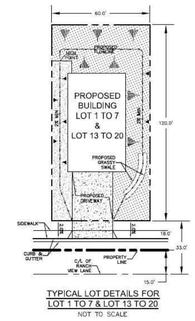
POST-CONSTRUCTION BMP SITE PLAN FOR SILVER BEACH VALLE RESEDA TRACT 38066





LEGEND

- D / 3.0 — DRAINAGE AREA / ACREAGE
- MAJOR DRAINAGE AREA BOUNDARY
- SUBAREA DRAINAGE BOUNDARY
- PROPOSED STORM DRAIN
- FLOW LINE (SURFACE FLOW)
- FLOW LINE (PIPE FLOW)
- 1 — NODE & NODE #
- EXISTING STORM DRAIN



TYPICAL LOT DETAILS FOR LOT 1 TO 7 & LOT 13 TO 20
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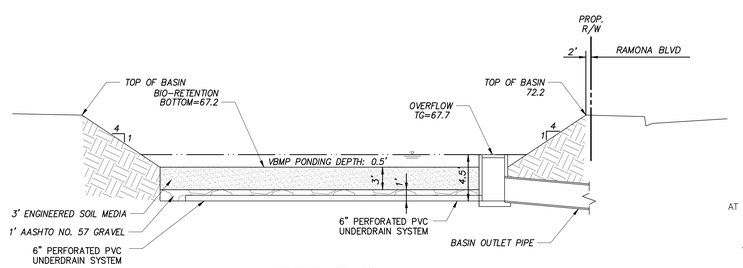

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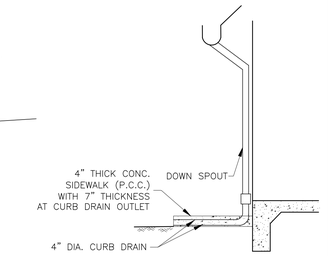

ROOF DRAIN/DOWN SPOUT DETAIL
N.T.S.

REVISION			
DESCRIPTION	REC.	APPR.	DATE

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CITY OF SAN JACINTO
CALIFORNIA

VALLE RESEDA

N. RAMONA BLVD SAN JANCINTO, CA 92582

SCALE: AS SHOWN

DRAWING NO. | PROJECT NO. | SHEET 6 OF 6 SHEETS

W.O. 4513-1 TRACT NO. 38066 TENTATIVE TRACT MAP

PLOTTED BY: Sophie Pham DATE: Apr. 26, 2023 11:54:48 AM FILE: F:\1244\Planning\SA_Site\Exh_TTM\SHT06.dwg

FIGURE 4

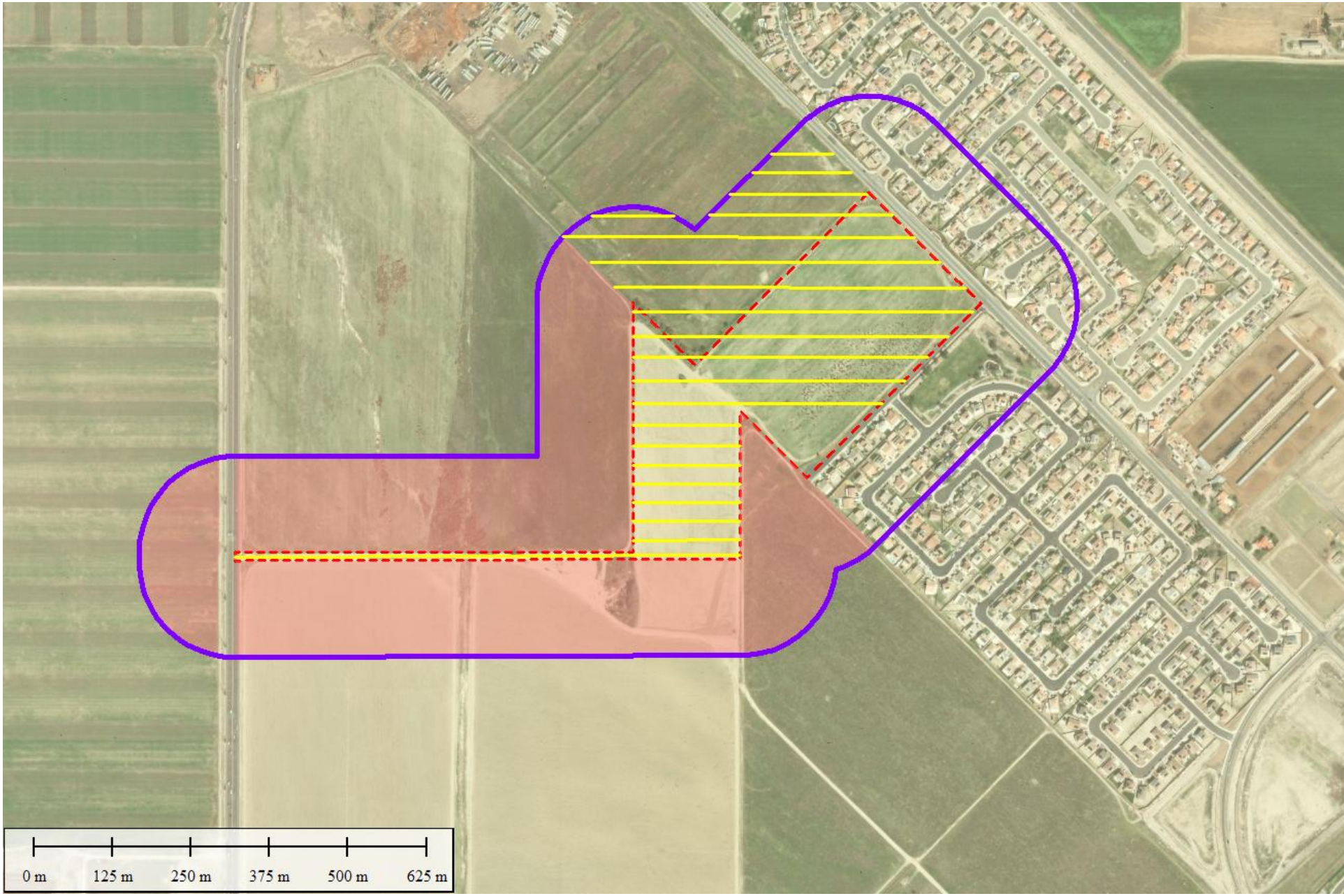

Figure 4
Survey Area Map
TTM 38066
San Jacinto
Riverside County, California

FIGURE 5

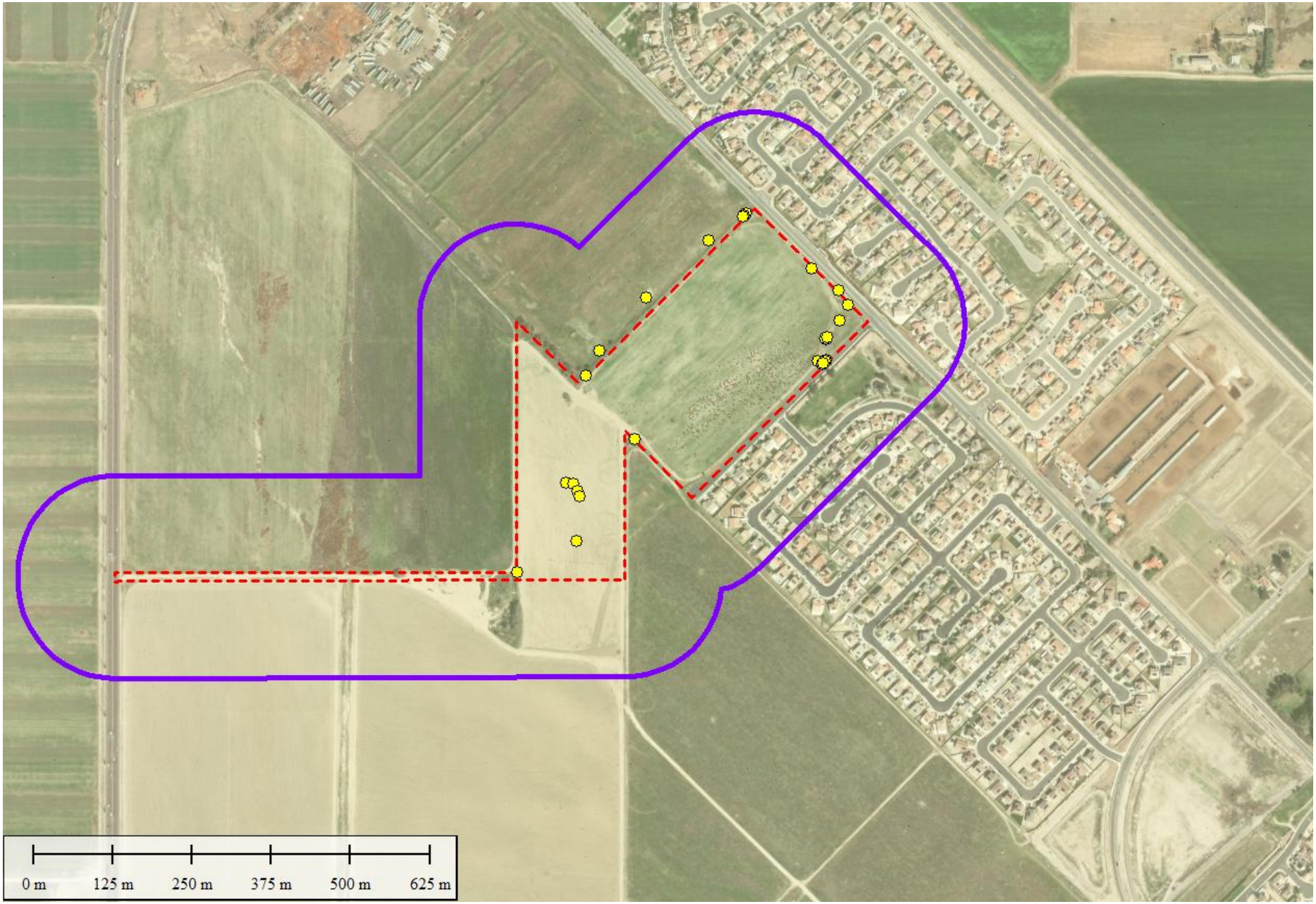

Figure 5
Survey Results Map
TTM 38066
San Jacinto
Riverside County, California

Hernandez Environmental Services

APPENDIX A



Northern border of site where potentially suitable burrows were found. View facing northest.



Ruderal habitat within the center of the site. View looking northwest.



Potentially suitable burrowing owl burrow complex surrounded by ruderal vegetation.

Hernandez Environmental Services

APPENDIX C – ARCHAEOLOGICAL STUDY

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PHASE 1 CULTURAL RESOURCES ASSESSMENT OF THE 37.84-ACRE VALLE RESEDA PROJECT SITE (TRACT 38066) LOCATED IMMEDIATELY SOUTHWEST OF THE INTERSECTION NORTH RAMONA BOULEVARD AND RANCH VIEW LANE, CITY OF SAN JACINTO, RIVERSIDE COUNTY

by

Robert S. White

Archaeological Associates
P.O. Box 180
Sun City, CA, 92586

Tel: (951) 244-1783
Fax: (951) 244-0084

archaeological_associates@hotmail.com

for

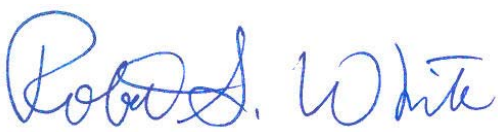
Mr. Roger Zheng
Camelia Homes
8201 Grant Drive
Huntington Beach, CA 92646

APNs 436-030-001, 436-040-006 & -008

Revised August, 2023

KEYWORDS: Phase I Survey, N. Ramona Blvd., San Jacinto, Riverside County

CERTIFICATION: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.



.....
Robert S. White
Principal Investigator

NATIONAL ARCHAEOLOGICAL DATA BASE INFORMATION

Author:	Robert S. White
Consulting Firm:	Archaeological Associates P.O. Box 180 Sun City, CA 92595 Tel (951) 244-1783 Fax (951) 244-0084
Report Date:	**Revised, August, 2023**
Report Title:	Phase I Cultural Resources Assessment of the 37.84-Acre Valle Reseda Project Site (Tract 38066) Located Immediately Southwest of the Intersection of North Ramona Boulevard and Ranch View Lane, City of San Jacinto, Riverside County
	Prepared for: Mr. Roger Zheng Camelia Homes 8201 Grant Drive Huntington Beach, CA 92646
USGS Quadrangle:	***San Jacinto*** 7.5', California, 1978/79
Study Area:	37.84 Acres, (APNs 436-030-001, 436-040-006 & -008). Southeast ¼ of the Northeast ¼ of Section 20 and the West ½ of the Northwest ¼ of Section 21, Township 4 South, Range 1 West, SBBM.
Keywords:	Phase I Cultural Resources Assessment, City of San Jacinto, Riverside County, CA **Negative Results**

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MANAGEMENT SUMMARY

At the request of Camelia Homes, Archaeological Associates has revised a Phase I Cultural Resources Assessment of 37.84 acres of vacant land identified as the Valle Reseda project site, Tract 38066 (APNs 436-030-001, 436-040-006 & -008). The original Phase I study conducted by Archaeological Associates in 2021 was identified as the Silver Beach Grand project site (P20-012). The study area is located immediately southwest of the intersection of North Ramona Boulevard and Ranch View Lane in the City of San Jacinto, Riverside County. Presently, it is desired to construct a residential subdivision on the property.

The purpose of this study was to identify all potentially significant cultural resources situated within the boundaries of the study area. This information is needed since adoption of the proposed development plan could result in adverse effects upon locations of archaeological or historical importance. All field notes, background research and photographs are in the possession of Archaeological Associates.

An updated, in-person records search failed to indicate the presence of any prehistoric or historic resources within the boundaries of the study area. The results of the field study conducted in 2020 were equally as negative. Consequently, no additional work in conjunction with cultural resources is recommended including monitoring of any future earth-disturbing activities.

In the event that human remains are encountered during the course of any future development, California State Law (*Health and Safety Code Section 7050.5 and Section 5079.98 of the Public Resources Code*) states that no further earth disturbance shall occur at the location of the find until the Riverside County Coroner has been notified. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD).

I. INTRODUCTION

The following report was written for Camelia Homes by Archaeological Associates (AA). It describes the results of a revised Phase I Cultural Resources Assessment of the 37.84-acre Valle Reseda residential project site identified as Tract 38066. The original Phase I study of the property conducted by AA in 2021 was for Golden Ocean Realty LLC and identified as the Silver Beach Grand project site (P20-012). The study area is located adjacent to the south side of North Ramona Boulevard immediately west of Ranch View Lane, City of San Jacinto, Riverside County. Presently, project proponents desire to develop the property with 206 single family homes and a water quality basin.

The purpose of this assessment was to identify all potentially significant cultural resources situated within the study area. This information is needed since adoption of the proposed development plan could result in adverse effects upon locations of archaeological or historical importance. Our assessment consisted of: (1) an updated, in-person records search conducted to determine whether any previously recorded historic or prehistoric material is present on the property, (2) literature and archival review, (3) Sacred Lands File Check/Native American Scoping, and (4) a field reconnaissance intended to identify any previously unrecorded cultural resources within the boundaries of the project area

The intensive survey of the property was conducted by Robert S. White (Principal Investigator, County Approved Archaeologist #164), and Richard Guttenberg, M.A. RPA (surveyor, County Approved Archaeologist). The study was conducted in accordance with the California Environmental Quality Act (CEQA), as amended in 2015, which includes criteria for eligibility to the California Register of Historical Resources (CRHR). This report was prepared according to the *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* contained within the States Preservation Planning Bulletin Number 4(a) (California Department of Parks and Recreation 1989).

II. SETTING

A. Study Area Location

Regionally, the study area lies in the San Jacinto Valley approximately 2 ½ miles northwest of the historic core of San Jacinto and 1.25 miles southwest of the San Jacinto River, southwestern Riverside County (fig.1). The parcel is irregular in shape and adjoins N. Ramona

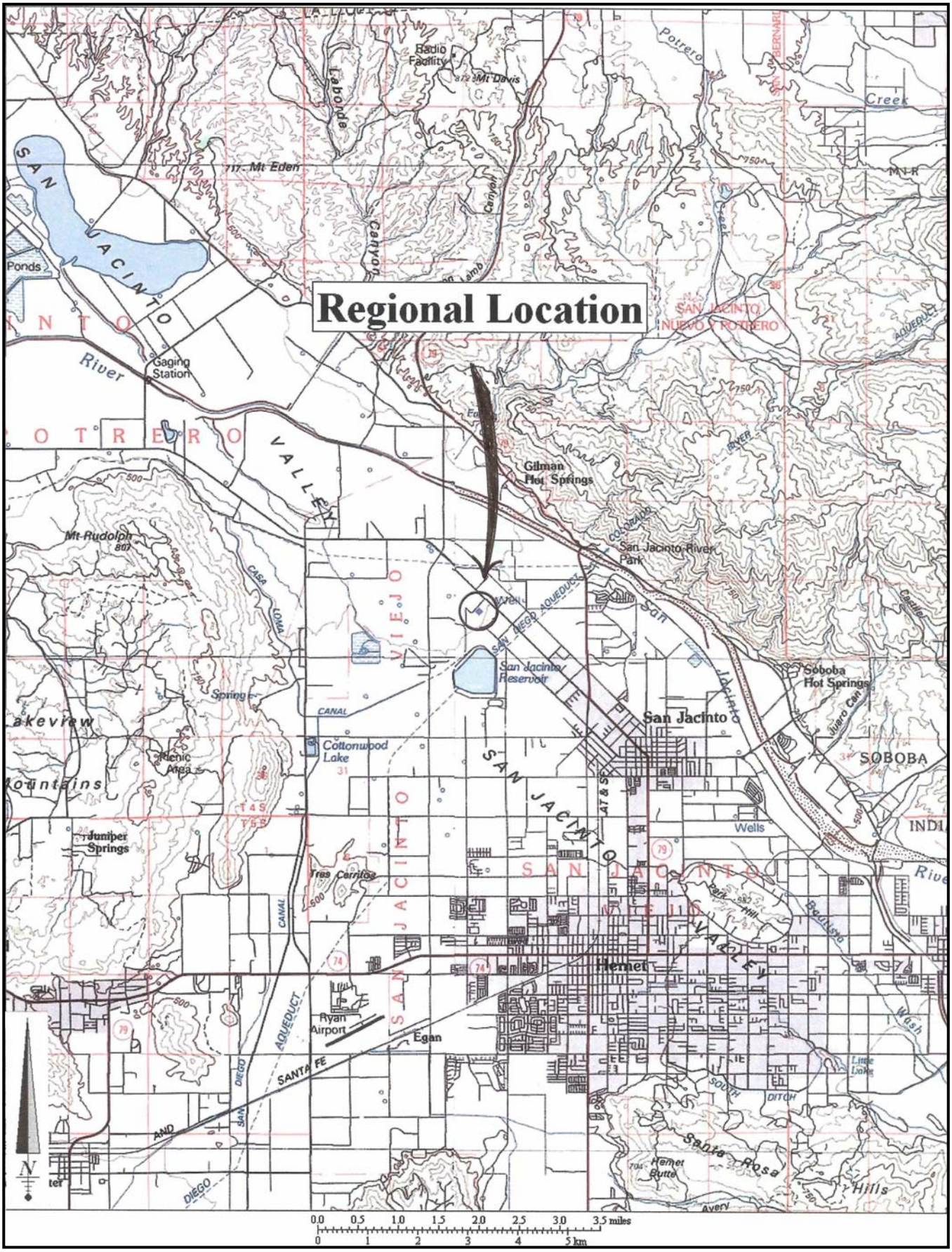

Figure 1. Regional location of the project area as indicated on a portion of the *Santa Ana* USGS 1:100,000 scale topographic map sheet (1983).

Blvd. on the north and Ranch View Lane on the east. The remaining project boundaries abut active or fallow farm land. Legally, the subject property lies within the Southeast ¼ of the Northeast ¼ of Section 20 and the West ½ of the Northwest ¼ of Section 21, Township 4 South, Range 1 West, SBBM as shown on a portion of the *San Jacinto* USGS 7.5' Topographic Quadrangle (fig. 2).

B. Natural Setting

The study area is situated in a region of the county where the climate consists of hot and dry summers followed by mild to occasionally wet winters. Topographically, the property is flat and devoid of any relief. Elevations average 1480 feet above mean sea level throughout the property. On-site vegetation is virtually non-existent due to recent discing. What native vegetation remains is restricted to the periphery of the study area comprising exotic weeds and forbes. One very large cotton wood tree lies in the southern portion of the development area. No bedrock exposures, isolated boulders or sources of natural surface water were encountered anywhere on the property (fig 3.). Fauna observed were limited to doves, ravens and ground squirrels.

Disturbance within the study area is moderate but not unexpected given past land use for agriculture. Disturbed areas comprise: 1) cultivation of the property for dry farming and, 2) an active water well adjacent to Ranch View Lane and 3) underground irrigation pipeline (modern). In no way did the nature of the disturbance hinder the efforts of the field study.

C. General Prehistory of southern California

1. Introduction

The Native Americans occupying most of Riverside, Orange, and Los Angeles Counties at the time of the Spanish arrival had not always held these territories. Their earliest well-documented predecessors, who are known only archaeologically, are collectively referred to as the "Millingstone" peoples. Millingstone groups are thought to have been scattered over much of southern California from as early as ca. 6000 B.C. (cf. Wallace 1955). The Millingstone people were principally seed and root gatherers who rarely seemed to have developed large settlements and who probably never occupied a single area on a year-round basis.

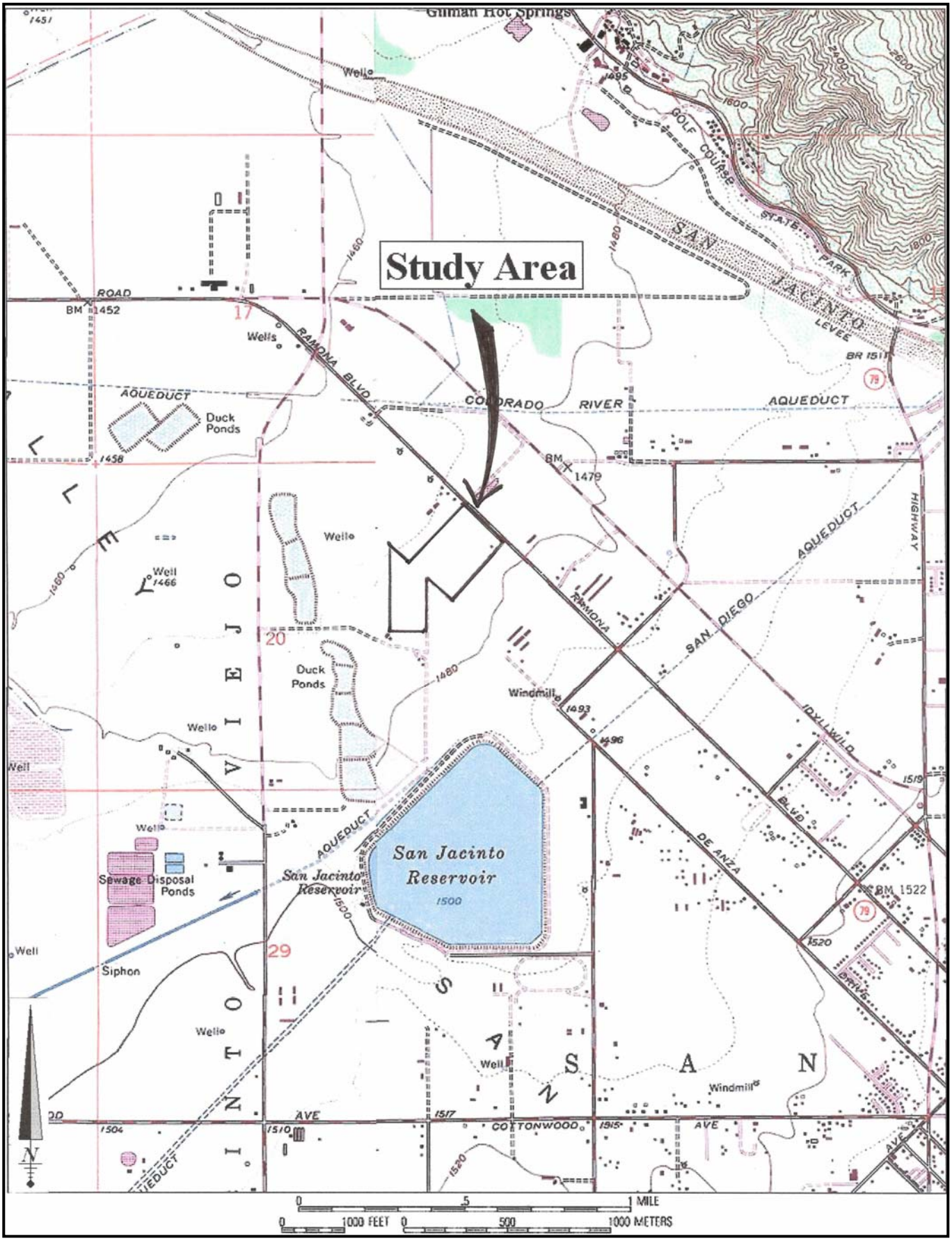

Figure 2. Study area as shown on a portions of the S*an Jacinto* 7.5' USGS Topographic Quadrangle (1978/79).

About 1500 B.C. (dates vary with locale and researcher), a change took place. This consisted of the introduction of stone mortars and pestles, implements which greatly facilitated the processing of acorns. The new era has been called the "Intermediate" (ibid.; Elsasser 1978) and is very poorly understood. What is certain is that the Intermediate peoples were replaced by Shoshoneans who moved in from the Great Basin for unknown reasons.

The exact time at which the Shoshonean "incursion" took place is uncertain but most authorities would place it sometime between A.D. 500 and 1000 (e.g. Kroeber 1925:578). The indigenous Intermediate populations were either absorbed or decimated as the Shoshonean-speakers settled the entire coast from about the latitude of the southern edge of the Santa Monica Mountains south to the area of the San Luis Rey River. Their new territory extended inland across Riverside County.

It is not known whether the Shoshoneans arrived in a great wave over a relatively short period of time or whether they filtered in over hundreds of years. By the time the Spanish arrived, they had become subdivided into three groups: (1) the Gabrieliño who occupied Los Angeles and northern Orange Counties, (2) the Juaneño who resided around what became San Juan Capistrano, and (3) the Luiseño who lived in western Riverside and northern San Diego Counties. It is to be emphasized that the dialectical differences between the groups were minor, all being mutually intelligible. Thus, the differences between say, the Luiseño and Juaneño generally relate to territory and environment. Of course, certain mythological variation also developed over time. It should be noted that some Luiseño groups reject the notion of the Shoshonean Incursion. Based upon their oral tradition of creation stories and songs they maintain that they have always occupied their traditional territory from time immemorial and did not migrate to it (Masiel-Zamora 2013:2).

D. A Brief Culture History of the Luiseño

1. Introduction

Our study area falls within the historically known territory of the Luiseño Indians. The Luiseño were the most southwesterly of all Takic speaking peoples and were among the most populous of the Native American groups early in this century (Strong 1929:274). They survived in much greater numbers than their Shoshonean neighbors to the west (the Gabrieliño and Juaneño) and consequently there is more ethnographic literature relating to the Luiseño. Early investigators included Sparkman (1908), DuBois (1908), Kroeber (1925), Gifford (1918), and

Strong (1929). For an excellent source on Luiseño villages and settlement practices, the reader is referred to Oxendine's 1983 Ph.D. dissertation entitled "*The Luiseño Village During the Late Prehistoric Era.*" Here we shall present only a brief overview of what is known about the Luiseño people.

2. Territory

The Luiseño were so-named after the Mission San Luis Rey de Francia and appear never to have had a formal tribal name for themselves (Kroeber 1925:648). Their territory included only a very short section of the Pacific coast in the area of the mouths of the San Luis Rey and Santa Margarita Rivers (Strong 1929:275, Map 7). From here their territory stretched east as far as present Lake Henshaw and north as far as Perris Reservoir and possibly the San Gorgonio Pass.

3. Society

The Luiseño appear to have had two fundamental social organizations, the clan and the party. The clan comprised a patrilinear family group called a *tunglam* or *kamalmum* (meaning"names" and "sons, children" respectively; Kroeber 1925:686). Kroeber notes that children did not marry into either their father's or mother's clan and he concludes that this indicates that the clans consisted of actual kinsmen. Kroeber goes on to say that:

> On this basis the average "clan" would comprise only 25 or 30 souls, a number well within the limits of traceable blood. The total distinctness of the "clan" names in each district also argues for their being families of local origin (ibid.).Parties were made up of a clan with a hereditary chief to which other chieftainless clans have attached themselves (Gifford 1918:206). Informants claim that originally there were no parties but rather that every clan had its chief (Strong 1929:286).

Execution of religious ceremonies seems to have been a most important function of both the clans and the parties. The chief both ordered and executed ceremonies and a family with a chief constituted "*ipso facto"* religious society (Kroeber 1925:687). However, a clan without a chief had no religious authority and this explains why chieftainless clans became the satellites of

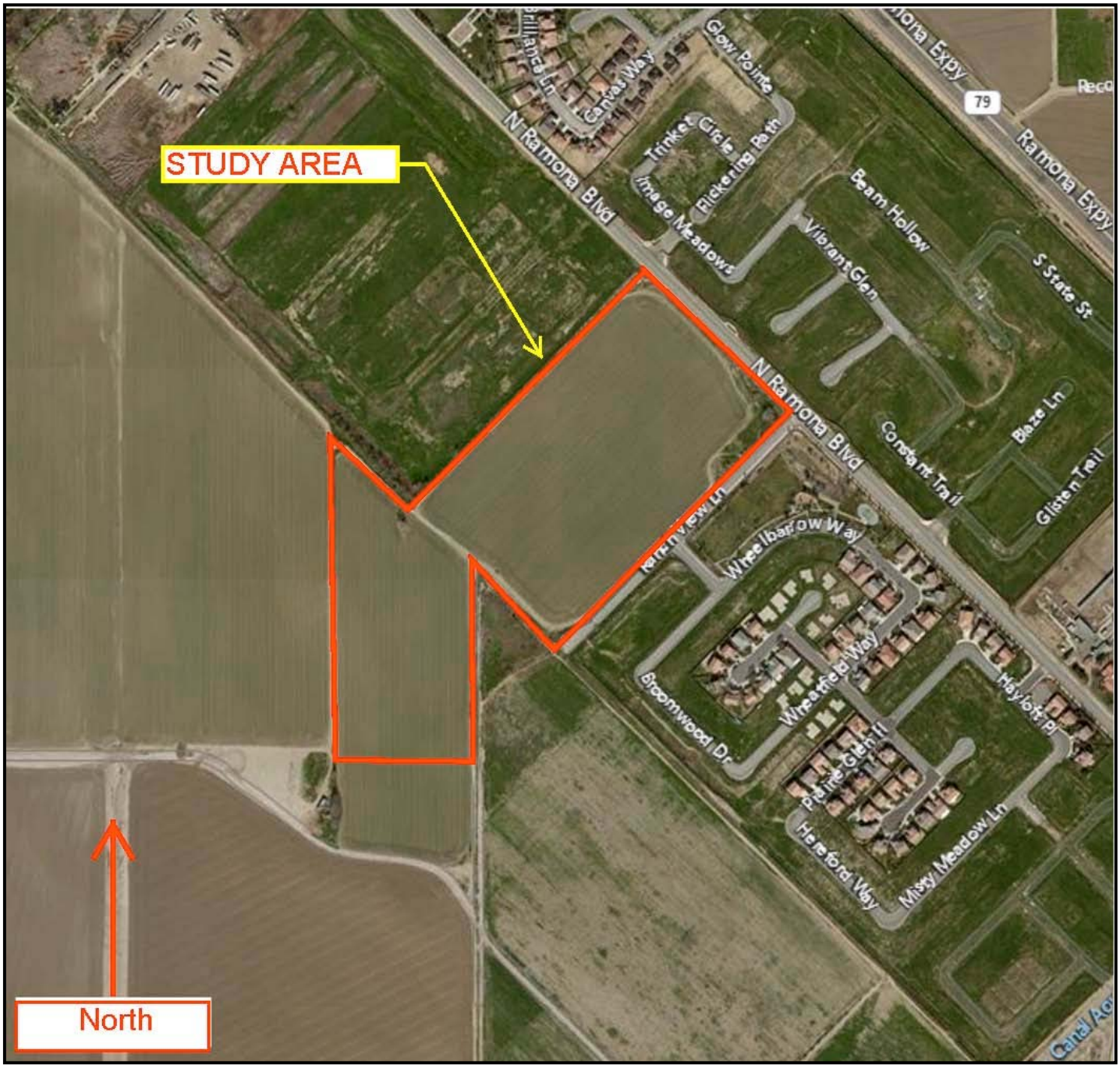

Figure 3. Study area as shown on aerial photograph.

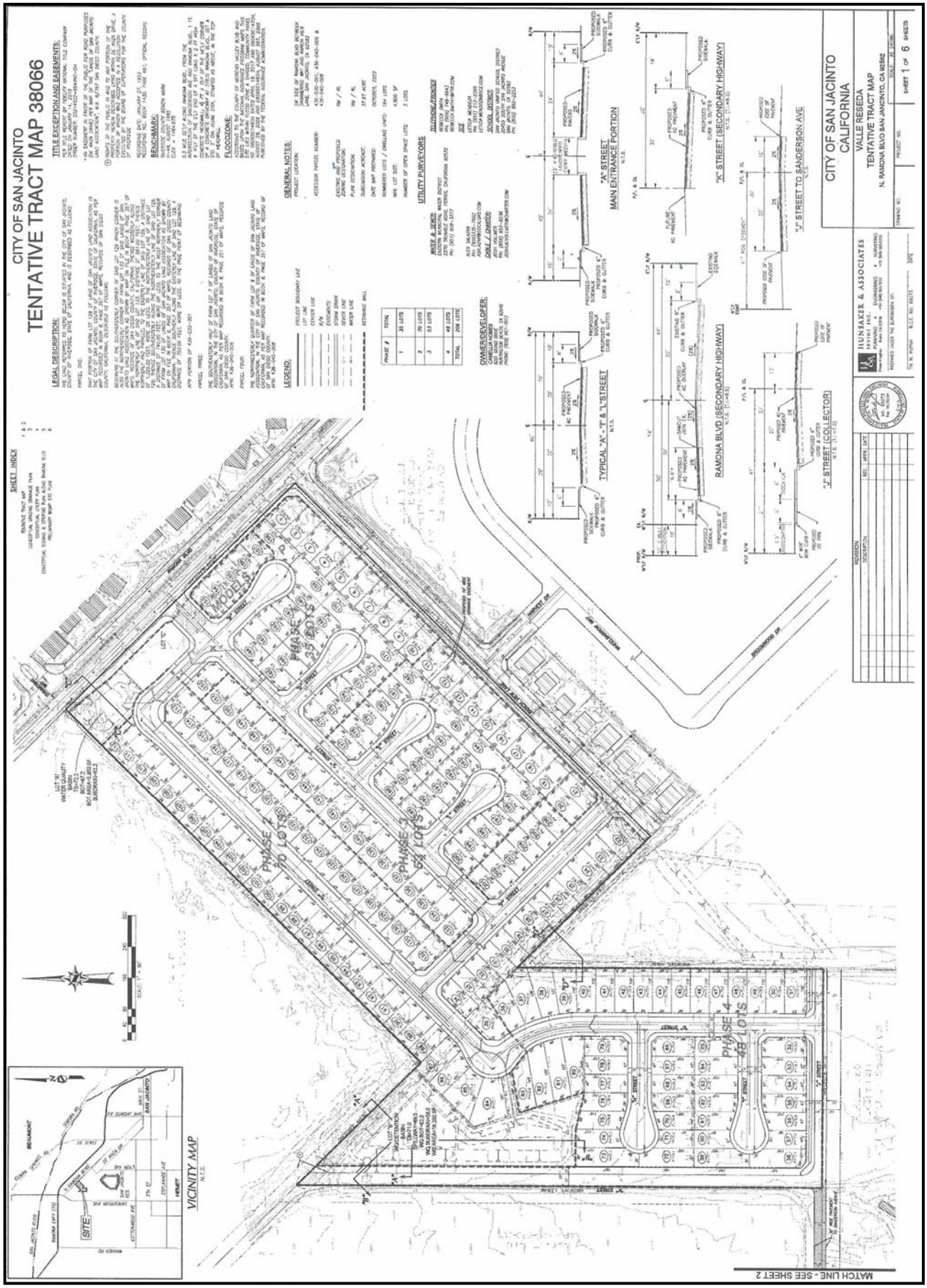

Figure 4. Study area as shown on Site Plan.

clans with chiefs. It seems likely that the chief may also have had great authority in other social areas but specific information regarding this is lacking.

As mentioned earlier, the position of chief was hereditary. Ordinarily, a chief was succeeded by his eldest son though this seems to have been subject to the approval of the clan members. If the members disapprove of the eldest son, a younger son or collateral relative was usually chosen. However, in rare instances a woman could become chief and Strong knew of several women who claimed this distinction (1929:292). Regarding the qualification of a chief, Strong says that he "...had to be generous and a good provider, know all the myths and rituals relating to clan ceremonies, and have in his possession by inheritance the *maswut* bundle containing the ceremonial impediments of the group" (ibid.).

4. Subsistence

The Luiseño were principally an acorn consuming people (Kroeber 1925:649). The acorns were harvested in the fall and stored through the winter. They were processed by drying the acorn meats, then grinding them in a mortar, and finally leaching the acorns in fresh water to remove the unpalatable tannic acid. The acorns of the live and black oak (*Quercus kelloggii, Quercus agrifolia*) were preferred to the dwarf oak (*Quercus dumosa*) though the latter species could be used when the acorn crop from the other trees failed.

Other native flora exploited by the Luiseño include various kinds of seeds which are followed in importance by foliage and shoots. Fruit and berries were third in importance followed by roots. Kroeber remarks that most of the seeds were gathered from plants of the *Compositae* (sunflower) and *Labiatae* (mint) families as opposed to cereal grasses (ibid.). Plants bearing edible stems and leaves are very numerous but the most important for the Luiseño were species in the clover family. Yucca (*Yucca whipplei*) was also used to provide the well-known baked "mescal".

Kroeber comments that "pulpy fruits" are small and not especially abundant in Luiseño habitat (1925:649). Nonetheless, they were utilized and it is our contention that the fruit from plants of the *Rosaceae* (Rose) family may have been more important than Kroeber indicates. This may have been particularly true of the Hollyleaf Cherry (*Prunus icifolia*; cf. Wilke 1974. Bean 1972; Raven 1966 for description of plant).

Plants were used for a great variety of purposes other than consumption. These include pharmaceuticals, fabrication of houses, implements, clothing, baskets, and dyes. Many types of animals were hunted and it may be more useful to cite the animals not hunted than to list those

that were. According to Kroeber, animals not eaten by the Luiseño include the dog, coyote, bear, tree squirrel, pigeon, dove, mud hen, eagle, buzzard, raven, lizards, frogs, and turtles (ibid.:652). Probably the most important game comprised deer, small rodents such as woodrats, and game birds such as quail and ducks. Grasshoppers were also consumed. The Luiseño who lived along the coast gathered molluscs and fished from canoes or balsas using nets and line made of yucca fiber.

5. Material Culture and Technology

Archaeological data regarding the Luiseño usually relate to the material culture and particularly to those items manufactured from non-perishable materials. Therefore, a brief description of the material culture is especially pertinent to an archeological investigation.

Luiseño houses were made by excavating a shallow hole and then constructing a frame over the hole. The frame was then covered with branches which in turn were covered with earth. "There was a smoke hole in the middle of the roof, but entrance was by a door, which sometimes had a short tunnel built before it" (ibid.). Simple shades were also used in fair weather.

The Luiseño also built sweathouses which were similar in construction to the houses except for being smaller and having the door in one of the long sides. Warmth in the sweathouse was produced by an open fire, never steam. The sweathouse was used by most of the California tribes west of the deserts:

> The California sweathouse is an institution of daily, not occasional service. It serves a habit, not a medical treatment; it enters into ceremony and indirectly rather than as a means of purification. It is the assembly of the men, and often their sleeping quarters. It thus comes to fulfill many of the functions of a club; but is not to be construed as such, since ownership or kinship or friendship, not membership, determines admission (Heizer and Whipple 1951:8).

Luiseño dress was simple: women wore a two piece apron while men went naked when weather permitted. Footgear was worn only when rough ground had to be traversed and consisted of sandals manufactured from agave fiber. Tattoos were common, particularly on the chins of women. These were made by using a cactus thorn to prick charcoal into the skin.

Many other Luiseño fabricated items were related to food collecting or processing. Most frequently encountered are the various forms of bedrock grinding equipment. These were normally made on granite outcroppings near or adjacent to creek beds and oak stands. The grinding features are of three usual types:

A. Mortars. These are natural or pecked concavities in the rock. They are normally circular in plan and vary from 5 to 10 cm. in depth. Bedrock mortars were used in conjunction with stone or wooden pestles for pulverizing food.

B. Ovals or Bedrock Metates. These are small shallow oval depressions in the bedrock. They usually vary between 15 and 30 cm. in either dimension but are almost always oval in plan. Normally ovals are less than 3 cm. deep. They were probably used in conjunction with manos (hand stones) for grinding food.

C. Slicks. These are amorphous smooth spots on the bedrock. Slicks may measure up to 150 x 150 cm. in their horizontal dimensions but are almost always totally lacking in depth. The smoothness appears to be the result of a mano being rubbed across the natural contour of the stone.

Portable mortars were also manufactured by the Luiseño and they, along with manos, comprise the remainder of the usual groundstone complex (though other utilitarian and decorative groundstone objects occur occasionally).

Most cutting and shaping chores were performed using chipped stone tools manufactured from metavolcanic rocks or cherts. The sharp edges of simple "flakes" struck from amorphous cores are the most common cutting tool. Planes and scraping tools for shaping and removing plant fibre were also manufactured from chipped stone as were projectile points (arrow or dart points). Luiseño projectile points are usually small, triangular specimens many of which bear a notch on either side.

The Luiseño also manufactured pottery using a stone and a wooden paddle (the so-called "paddle and anvil technique"). Usually the ceramics were fabricated from a reddish clay mixed with coarse sand. It was then coiled and finally was shaped by paddling against the surface using the paddle as "backing" on the opposite surface. This family of pottery is characterized by a reddish brown hue and coarse gritty fabric is referred to as "Tizon Brown Ware."

Other Luiseño utilitarian objects were manufactured from basketry. In addition to the usual utilitarian baskets, they also made basketry caps intended to protect the head from the straps on their carrying nets. The caps, which were "somewhat conical", were also worn by women to prevent hair falling into the mortar when they were grinding food. Granaries were also manufactured from basketry.

Evidence for Luiseño ornamental objects is similar to that for their Kumeyaay neighbors to the south. May (1975) describes Kumeyaay ornaments as follows:

> Most of the beads were made by breaking down the sides off an olivella shell and drilling holes in the center. The edges were then ground round. Some shells merely had their spires lopped off.

> Clay pendants are almost always old potsherds which have been ground oval and drilled at one end. (May 1975:19).

6. Religion

The Luiseño (and presumably their northern and western neighbors) practiced a religion which centered around the god *Chinigchinich* (Strong 1929:338). He was a living god who watched and punished and who ordained the sacred practices except for the mourning ceremonies (Kroeber 1925:656). Luiseño "monotheism" has struck many scholars as remarkable:

> This idea of a present and tremendously powerful god, dictating not only ritual but the conduct of daily life--a truly universal deity and not merely one of a class of spirits or animals--is certainly a remarkable phenomenon to have appeared natively among any American group north of Mexico (ibid.).

It may be that the development of the god is actually a result of the influence of Christianity as spread by the missionaries. In any case, the origin of the *Chinigchinich* religion is traditionally ascribed to Santa Catalina Island. The cult of the god was built around rites entailing Jimsonweed (Toloache) drinking.

Luiseño ceremonies may be divided into two general categories: initiations and mourning rites. The most important of the initiation ceremonies was the Toloache initiation where boys were given the Jimson weed potion and experienced a series of dreams which later became ant sacred to them as individuals. Another ceremony, possibly connected with the Toloache, was the ordeal:

> The boys were lain on ant hills, or put into a hole containing ants. More of the insects were shaken over them from baskets in which they had been gathered. The sting or bite of the large ant smarts intensely, and the ordeal was a sever one, and rather doubtfully ameliorated when at the conclusion the ants were whipped from the body with nettles (Ibid.).

Girls were also initiated when they came of age. Their ceremony, called the *Wekenish* by the Luiseño, was practiced by all of the Shoshonean speaking peoples of southern California. The ceremony entailed placing the girls in a pit which contained a lining of heated rocks covered with grass or matting. The girls remained in the pit for several days. The heat was intended to promote fertility and good health during the girl's adulthood.

The Luiseño practiced cremation of their dead. There are at least half a dozen mourning ceremonies that took place after the cremation. These entailed such rites as washing the clothes of the deceased and burning images of him. Special ceremonies were held for important personages such as chiefs. The ritual killing of an eagle on the anniversary of a chief's death is an example of the latter (Kroeber 1925:676).

III. RESEARCH ORIENTATION

A. Introduction

It is often said that human occupation of southern California may go back as far as 10,000 years ago (Van Horn 1987:22). Evidence for these relatively early people is very sparse and presumption of a very low population density at that time seems entirely reasonable. The "original" people were soon to be supplanted or absorbed by a new population. Archaeologists generally agree that sometime around A.D. 500, coastal southern California, including the Inland Empire region, became home to migrant Shoshonean peoples moving in from the Great Basin.

B. Research Goals

The goals of our research were to identify known locations of potential significance situated within the study area. Our hypotheses were as follows:

(1) Prehistoric sites may be found almost anywhere but are generally located in areas that offered access to water and plant resources. In this particular area, grass lands and the occasional water course lined with oak trees would have been most attractive. Granitic boulders and outcrops were also commonly utilized as milling stations for vegetal foodstuffs and to a lesser extent rock shelters and rock art sites. Typically, prehistoric sites may comprise bedrock milling features, rock art, scatters of potsherds, fire-affected rock, chipped stone implements, and at times, human cremations. Pottery sherds, of Tizon Brown Ware and possibly Lower Colorado Buff Ware may also occur at late period sites in the area.

(2) Historic sites in the region would most likely be associated with early farming activities. Lacking standing structures, remains of these homesteads and farmsteads typically comprises concrete, river cobble or adobe structure foundations, irrigation systems and trash scatters. However, not all debris scatters (e.g. tin can, glass, crockery) can be connected to a particular home or farmstead. In many instances, isolated scatters of dumped historic debris represent nothing more that illicitly discarded rubbish.

IV. ARCHIVAL RESEARCH METHODS

A. Cultural Resources Records Search

An in-person records search of the study area was conducted by Robert S. White on August 24, 2023 at the Eastern Information Center (EIC), University of California. The search also included a review of all previously recorded prehistoric and historic resources situated within a one-mile radius of the project area. Additionally, the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), California Historical Landmarks (CHL), California Points of Historical Interest (CPHI), and the California Directory of Properties (DOP, aka the Historic Resources Inventory [HRI]) were reviewed for the purpose of identifying historic properties.

1. Previous Surveys

a. Inside Study Area

The results of the search indicated that the study area had been previously surveyed for cultural resources as part of the 800-acre Sunrise Ranch Project in 1991 (Drover 1991). Drover's assessment failed to identify any prehistoric or historic resources with the boundaries of the current study area.

b. Outside Study Area

Outside the study area, a minimum of ten cultural resource studies have been conducted within a one-mile radius. These investigations cover approximately 95% of the surrounding land within the search radius. They include survey reports for linear, and both small (less than 20 acres) and large (40 acres or more) projects. The largest of these studies was the aforementioned 800-acre Sunrise Ranch Project conducted in 1991 that included the Valle Reseda property (ibid). The nearest, more recent study was for a power pole replacement project conducted in 2009. Located approximately 7/8-mile to the southeast, the results of the Phase I Assessment were entirely negative (Heidelberg 2009).

2. Previously Recorded Archaeological Sites Located Within the Study Area

The results of the records search indicated that no prehistoric or historic sites or isolates have been previously recorded within the boundaries of the study area.

3. Prehistoric Archaeological Sites/ Isolates Within a One-Mile Radius

No prehistoric archaeological sites (prehistoric) have been documented within a one-mile radius of the study area. However, two prehistoric isolates have. Both comprise bifacial manos and were found within approximately 500 feet of one another. The closest of these (Primary #33-14888) lies approximately 1-mile to the southwest of the project area (Moslak 2004). Each of these resources are summarized in Table 1 below:

Table 1. Archaeological Sites/Isolates within a One-Mile Radius.

Site Number (CA-SBR-) or (36-)	**Site Description**
33-148888	Isolated, bifacial granitic mano. Battered around circumference and/or shaped.
33-148889	Isolated, bifacial semi-crystaline quartz mano. Battered around circumference and/or shaped.

4. Historic Buildings/Structures/Features Within a One-Mile Radius

Outside the study area, eight historic resources have been recorded. Four include farm and ranch houses, one consists of a section of abandoned road and another is a irrigation feature. Additionally, a portion of the San Diego Aqueduct alignment and the Russian Trans-Polar Landing Site also lie within the search radius. The closest of these resources to the study area is historic irrigation feature comprising a vertical concrete irrigation feature (Primary # 18035) Taft & Lynch 2010). Each of these resources is summarized in Table 2 below:

Table 2. Historic Buildings/Structures/Features within a One-Mile Radius

Primary #	**Resource Description**
33-7309	Mediterranean/Spanish Revival residence located at 22051 Lyon Avenue constructed in 1939. In good condition at the time of recording.
33-7322	Bungalow style home located at 22148 Sanderson Avenue constructed circa 1901-1926. Earthquake damage evident.
33-7351	Vernacular Ranch Style house and associated Moderne Style milking parlor located at 38460 De Anza Drive. House was constructed in 1890, the milking parlor in 1937. given.
33-7352	Vernacular Ranch Style residence located at 38691 De Anza Drive constructed in 1900. High pitched roof and very tall brick chimney. Associated garage and barn.
33-9697	Russian Trans-Polar Landing Site. California Point of Historical Interest [(CPHI) Riverside County Historical Commission 1988].
RIV-8195 33-15734	San Diego Aqueduct alignment (underground). Appears eligible for the National Register of Historic Places.
33-16637	Abandoned 147-foot paved section of N. Ramona Boulevard. No date of construction given.
33-18035	Vertical concrete pipe with associated irrigation features. Characterized as a 'tankhouse' ?? Date is speculative, early to mid twentieth century. Closest historic resource to the study area.

5. Heritage Properties

No listed National Register of Historic Places (NRHP) or California Historical Landmarks (CHL) have been recorded within a one-mile radius of the project. However, the Russian Trans-Polar landing Site is listed as a California Point of Historical Interest [(CPHI) Riverside County Historical Commission 1988]. The San Diego Aqueduct has been previously evaluated and appears eligible for the National Register of Historic Places [(NRHP).

B. Historic Map Research

In addition to the records search, numerous historic General Land Office (GLO) and Geological Survey (USGS) maps of the San Jacinto region were inspected. These maps are on file with one or more of the following entities: Bureau of Land Management, Map Room of the Science Library at UC Riverside, the USGS TopoView Historic Topographic Map Database, and the California Historic Topographic Map Collection housed in Special Collections at the Merriam Library at California State University, Chico. These included:

GLO Map of Township No. 4 South Range No.1 West San Bernardino Meridian
Surveyed 1852-1867, Examined and Approved September 27, 1867

GLO Map of Township No. 4 South Range No. 1 West San Bernardino Meridian
Surveyed 1852-1880, Examined and Approved May 8, 1885

GLO Map of Township No. 4 South Range No. 1 West San Bernardino Meridian, California, Surveyed 1894-1900, Examined and Approved March 4, 1901

Southern California Sheet No.1, 1:250,000, 1901 reprinted 1948
Surveyed 1893-1900.

1901 *San Jacinto* 1:125,000 USGS Topographic Quadrangle

1953 *San Jacinto* 7.5' USGS Topographic Quadrangle

1953 *San Jacinto* 7.5' USGS Topographic Quadrangle, Photorevised 1972

1953 *San Jacinto* 7.5' USGS Topographic Quadrangle, Photorevised 1979

A review of these maps was performed for the purpose of identifying locations of potential historical resources. No man-made features appear within the parcel boundaries until a water well is depicted on the Photorevised 1972 edition of San Jacinto 7.5' Quadrangle. The well, which was in use until recently, lies adjacent to Ranch View Lane.

C. Land Patents

Archival research also included a review of land patents on file with the Bureau of Land Management (BLM) in Sacramento. The subject parcel lies within the Southeast ¼ of the Northeast ¼ of Section 20 and the West ½ of the Northwest ¼ of Section 21, Township 4 South, Range 1 West, as shown on a portion of the *San Jacinto* USGS 7.5' Topographic Quadrangle, San Bernardino Base Meridian. Office records indicate that a Serial Patent for 35,014.68 acres (San Jacinto Viejo) was issued to Resaria de Estudillo Aguirra, Jose Antonio Estudillo, Concepcion Estudillo, Francisco Estudillo, Guadalupe Estudillo, Jose Maria Estudilllo, and a possible second Jose Antonio Estudillo on January 17, 1880 by authority of the March 3, 1851:Grant-Spanish/Mexican (9 Stat. 631). The patent included all of Section 29. The land patent is recorded as Document Nr: Plc 489, Accession #/BLM Serial # CACAAA 080421. It is highly unlikely, although unconfirmed, any of the assignees constructed the small dwelling within the boundaries of the study area.

V. NATIVE AMERICAN SCOPING

A. Sacred Lands File Check

On December 15, 2020, a Sacred Lands File Check for the project area was requested by Robert S. White. The search was conducted on January 5, 2021 by Mr. Andrew Green, Cultural Resource Analyst for the Native American Heritage Commission in Sacramento. The results of the search indicated that no sacred Native American sites have been recorded within the boundaries of the study area. A list of both individual and Native American groups was also provided for further correspondence (see Appendix C).

B. Native American Correspondence

In order to learn more about the potential archaeological sensitivity of the project area, letters of inquiry were sent to Native American individuals and groups included on the NAHC consultation list. To date, no responses have been received.

VI. FIELD SURVEY

An intensive pedestrian survey of the study area was conducted by Archaeological Associates on November 28, 2020. Personnel included Robert S. White (Principal Investigator), and Richard Guttenberg, M.A. RPA (surveyor). The intent of the survey was to identify all

potentially significant cultural resources situated within the boundaries of the property. Historic resources include places and structures relating to significant historic events or having historical or special aesthetic qualities in and of themselves. Prehistoric resources include Indian sites of all types. All field notes, photographs, and maps generated or used during the field study are in the possession of Archaeological Associates.

The pedestrian survey began in the northeast corner of the study area and proceeded in a southerly direction. Surface visibility throughout the parcel was excellent, approaching 100% due to recent discing. The survey of the property was conducted by walking parallel transects spaced at 5-10 meter intervals. Backdirt piles resulting from rodent excavations were also examined for any signs of buried, archaeological deposits. By employing these techniques, a thorough examination of the study area was accomplished

VII. REPORT OF FINDINGS

A. Prehistoric Resources

The results of the updated records search failed to identify any prehistoric resources within the project boundaries. The results of the field study were also negative. No prehistoric resources of any kind were identified during the course of the investigation.

B. Historic Resources

The partial updated search also failed to identify any historic resources within the project boundaries. No historic resources were discovered during the course of the field study.

VIII. MANAGEMENT CONSIDERATIONS

A. Prehistoric and Historic Resources

The results of the records search and field study were negative for the presence of prehistoric and historic resources within the project area. Therefore, no further work in conjunction with prehistoric or historic resources is warranted or recommended including monitoring of earth disturbing activities connected with future develop.

B. Discovery of Human Remains

In the event that human remains are encountered during the course of any future development, California State Law (*Health and Safety Code Section 7050.5 and Section 5079.98*

of the Public Resources Code) states that no further earth disturbance shall occur at the location of the find until the San Bernardino County Coronor has been notified. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD).

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Plate I. Top: Looking southwest from the northeast property corner.
Bottom: Looking northeast from the southwest property corner.





Plate II. Top: Looking west across the southern project boundary from the eastern access road (south half of property). **Bottom:** Looking northwest from the extreme southeast corner (south half or property).

APPENDIX A: Personnel Qualifications

RÉSUMÉ OF

ROBERT S. WHITE

Principal, Archaeological Associates

Mr. White has been affiliated with Archaeological Associates since 1983. Starting in 1991 he became the firm's Director and in 2013, Principal. Mr. White has extensive experience in many aspects of cultural resource management, including but not limited to, project administration, field survey, excavation, lab analysis, land survey and cartography, archival research, budgeting, planning, and report writing/production. In those jurisdictions requiring professional certification, Mr. White is certified by the Counties of Riverside, Orange, and Ventura to conduct all phases of archaeological investigation.

Since 1983, Mr. White has conducted well over 500 prehistoric and historic archaeological investigations in Riverside, San Bernardino, Los Angeles, Orange, Kern, San Diego, Imperial, Sonoma, and Inyo Counties. Additionally, in concert with colleague Dr. David Van Horn, they have pioneered innovative techniques that revolutionized data recovery programs on large, low-density archaeological sites.

EDUCATION

B.A., Liberal Studies (emphasis in Anthropology), California State University Long Beach, 1987

A.A., Liberal Arts, Los Angeles Harbor College, 1977

PROFESSIONAL HISTORY

Joined Archaeological Associates in 1983
1991 to 2013, Director of Archaeological Associates
2013 to Present, Principal of Archaeological Associates
Riverside County Approved Archaeologist #164
Orange County Approved Archaeologist

PROFESSIONAL AFFILIATIONS

American Committee for the Preservation of Archaeological Collections (ACPAC)
Pacific Coast Archaeological Society.

PUBLICATIONS

Van Horn, David, Laura S. White, and Robert S. White

2005 The Prehistory of Gretna Green, a Site in Northern San Diego County, pp. 145-168 IN: Onward and Upward! Papers in honor of Clement W. Meighan (Keith L. Johnson, editor). Stansbury Publishing, Chico.

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TRAINING

Tortoise Awareness Training. Joshua Tree, San Bernardino County (September, 2008).

SB 18 Consultation Seminar. Riverside (December, 2005). Offered through the Governor's Office of Planning and research et. al.

- 1987 B.A. in Liberal Studies with emphasis in Anthropology, California State University, Long Beach.
- 1977 A.A. Degree in Liberal Arts, Los Angeles Harbor College.
- Riverside County Certified Archaeologist #164
- Orange County Certified Archaeologist
- Over 30 years of full-time experience conducting cultural resource management projects in southern California.

APPENDIX B: Records Search Results

CULTURAL RESOURCES RECORDS SEARCH

On August 24, 2023, an in-person cultural resources records search was conducted by Robert S. White at the Eastern Information Center (EIC) housed at the University of California. Consequently, there is no official letter from the Information Center to attach here. The in-person search included a review of all previously recorded prehistoric and historic archaeological sites situated within a one-mile radius of the study area. Additionally, the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), California Historical Landmarks (CHL), California Points of Historical Interest (CPHI), and the California Directory of Properties (DOP, aka the Historic Resources Inventory [HRI]) were reviewed for the purpose of identifying any historic properties. Copies of site record forms were obtained for those resources situated within a one-mile radius of the project. Pertinent archaeological reports were also were reviewed and all relevant information was incorporated into the study.

APPENDIX C

NAHC Sacred Lands File Check

ARCHAEOLOGICAL ASSOCIATES

December 15, 2020

Ms. Katy Sanchez
Associate Environmental Planner
California Native American Heritage Commission
1550 Harbor Boulevard, Suite 100
West Sacramento, CA 95691

RE: Sacred Lands File Check for the 37.84 acre proposed Silver Beach Grand residential development (P20-012) located immediately southwest of the intersection of North Ramona Boulevard and Ranch View Lane in the City of San Jacinto, Riverside County.

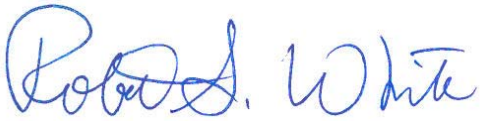
Dear Ms. Sanchez:

I am writing to you to request a Sacred Lands File Check for the above-referenced project in the City of San Jacinto, Riverside County. Briefly, per the request of the City of San Jacinto Community Development Department, Archaeological Associates has been asked to provide information with regard to prehistoric and historic resources in the vicinity of the proposed project. Thus, the reason for contacting your organization.

The 37.84-acre property comprises active farmland bordered by North Ramona Boulevard on the north and Ranch View Drive on the east. Vacant land abuts both the western and southern project boundaries. Presently, it is desired to develop the parcel with single-family residential housing. Legally, the subject property lies in the Southeast ¼ of the Northeast ¼ of Section 20 and the West ½ of the Northwest ¼ of Section 21, Township 4 South, Range 1 West, SBBM as shown on the *San Jacinto* 7.5' USGS Topographic Quadrangle, 1979 (attached).

We look forward to hearing from you. In the meantime, if you have any questions or desire additional information, please do not hesitate to contact me at (951) 244-1783.

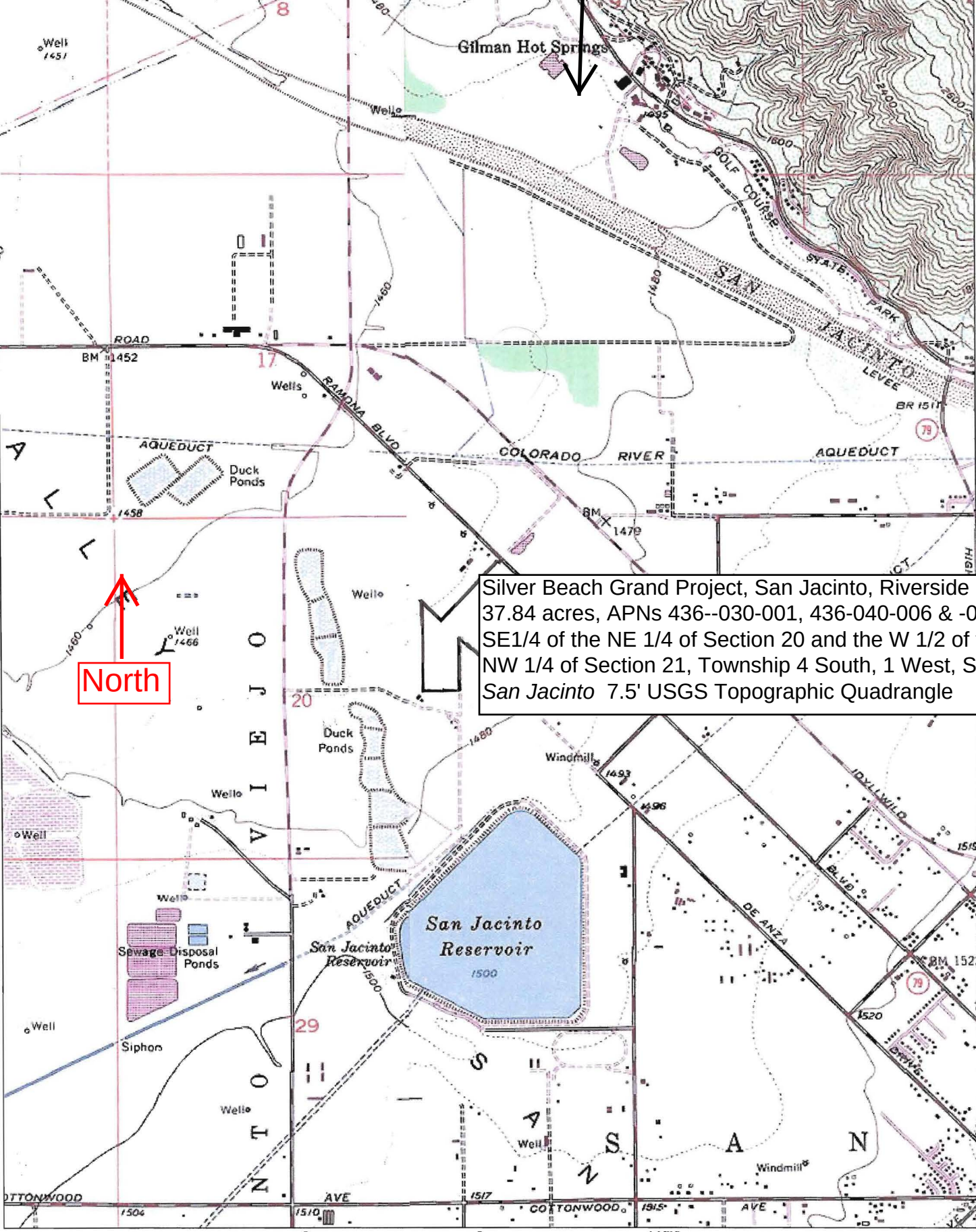
Very truly yours,



Robert S. White
Principal

RSW:file;nahc.com
by email

P.O. Box 180 Sun City, CA 92586 Tel: (951) 244-1783 Fax (951) 244-0084
archaeological_associates@hotmail.com



Silver Beach Grand Project, San Jacinto, Riverside
37.84 acres, APNs 436--030-001, 436-040-006 & -0
SE1/4 of the NE 1/4 of Section 20 and the W 1/2 of
NW 1/4 of Section 21, Township 4 South, 1 West, S
San Jacinto 7.5' USGS Topographic Quadrangle

NATIVE AMERICAN HERITAGE COMMISSION

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nahc@nahc.ca.gov
NAHC.ca.gov

January 5, 2021

Robert White
Archaeological Associates

Via Email to: archaeological_associates@hotmail.com

Re: Silver Beach Grand Residential Development Project, Riverside County

Dear Mr. White:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

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

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

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

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
Riverside County
1/5/2021

Agua Caliente Band of Cahuilla Indians
Patricia Garcia-Plotkin, Director
5401 Dinah Shore Drive — Cahuilla
Palm Springs, CA, 92264
Phone: (760) 699 - 6907
Fax: (760) 699-6924
ACBCI-THPO@aguacaliente.net

Agua Caliente Band of Cahuilla Indians
Jeff Grubbe, Chairperson
5401 Dinah Shore Drive — Cahuilla
Palm Springs, CA, 92264
Phone: (760) 699 - 6800
Fax: (760) 699-6919

Augustine Band of Cahuilla Mission Indians
Amanda Vance, Chairperson
P.O. Box 846 — Cahuilla
Coachella, CA, 92236
Phone: (760) 398 - 4722
Fax: (760) 369-7161
hhaines@augustinetribe.com

Cabazon Band of Mission Indians
Doug Welmas, Chairperson
84-245 Indio Springs Parkway — Cahuilla
Indio, CA, 92203
Phone: (760) 342 - 2593
Fax: (760) 347-7880
jstapp@cabazonindians-nsn.gov

Cahuilla Band of Indians
Daniel Salgado, Chairperson
52701 U.S. Highway 371 — Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 5549
Fax: (951) 763-2808
Chairman@cahuilla.net

Los Coyotes Band of Cahuilla and Cupeño Indians
Shane Chapparosa, Chairperson
P.O. Box 189 — Cahuilla
Warner Springs, CA, 92086-0189
Phone: (760) 782 - 0711
Fax: (760) 782-0712

Morongo Band of Mission Indians
Robert Martin, Chairperson
12700 Pumarra Road — Cahuilla
Banning, CA, 92220 — Serrano
Phone: (951) 849 - 8807
Fax: (951) 922-8146
dtorres@morongo-nsn.gov

Morongo Band of Mission Indians
Denisa Torres, Cultural Resources Manager
12700 Pumarra Road — Cahuilla
Banning, CA, 92220 — Serrano
Phone: (951) 849 - 8807
Fax: (951) 922-8146
dtorres@morongo-nsn.gov

Pala Band of Mission Indians
Shasta Gaughen, Tribal Historic Preservation Officer
PMB 50, 35008 Pala Temecula Rd. — Cupeno, Luiseno
Pala, CA, 92059
Phone: (760) 891 - 3515
Fax: (760) 742-3189
sgaughen@palatribe.com

Pechanga Band of Luiseno Indians
Mark Macarro, Chairperson
P.O. Box 1477 — Luiseno
Temecula, CA, 92593
Phone: (951) 770 - 6000
Fax: (951) 695-1778
epreston@pechanga-nsn.gov

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Silver Beach Grand Residential Development Project, Riverside County.

Pechanga Band of Luiseno Indians
Paul Macarro, Cultural Resources Coordinator
P.O. Box 1477 Luiseno
Temecula, CA, 92593
Phone: (951) 770 - 6306
Fax: (951) 506-9491
pmacarro@pechanga-nsn.gov

Quechan Tribe of the Fort Yuma Reservation
Manfred Scott, Acting Chairman
Kw'ts'an Cultural Committee
P.O. Box 1899 Quechan
Yuma, AZ, 85366
Phone: (928) 750 - 2516
scottmanfred@yahoo.com

Quechan Tribe of the Fort Yuma Reservation
Jill McCormick, Historic Preservation Officer
P.O. Box 1899 Quechan
Yuma, AZ, 85366
Phone: (760) 572 - 2423
historicpreservation@quechantribe.com

Ramona Band of Cahuilla
Joseph Hamilton, Chairperson
P.O. Box 391670 Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 4105
Fax: (951) 763-4325
admin@ramona-nsn.gov

Ramona Band of Cahuilla
John Gomez, Environmental Coordinator
P. O. Box 391670 Cahuilla
Anza, CA, 92539
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Fax: (951) 763-4325
jgomez@ramona-nsn.gov

Rincon Band of Luiseno Indians
Cheryl Madrigal, Tribal Historic Preservation Officer
One Government Center Lane Luiseno
Valley Center, CA, 92082
Phone: (760) 297 - 2635
crd@rincon-nsn.gov

Rincon Band of Luiseno Indians
Bo Mazzetti, Chairperson
One Government Center Lane Luiseno
Valley Center, CA, 92082
Phone: (760) 749 - 1051
Fax: (760) 749-5144
bomazzetti@aol.com

Santa Rosa Band of Cahuilla Indians
Lovina Redner, Tribal Chair
P.O. Box 391820 Cahuilla
Anza, CA, 92539
Phone: (951) 659 - 2700
Fax: (951) 659-2228
lsaul@santarosa-nsn.gov

Soboba Band of Luiseno Indians
Scott Cozart, Chairperson
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San Jacinto, CA, 92583 Luiseno
Phone: (951) 654 - 2765
Fax: (951) 654-4198
jontiveros@soboba-nsn.gov

Soboba Band of Luiseno Indians
Joseph Ontiveros, Cultural Resource Department
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San Jacinto, CA, 92581 Luiseno
Phone: (951) 663 - 5279
Fax: (951) 654-4198
jontiveros@soboba-nsn.gov

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Silver Beach Grand Residential Development Project, Riverside County.

Torres-Martinez Desert Cahuilla Indians
Michael Mirelez, Cultural Resource Coordinator
P.O. Box 1160 Cahuilla
Thermal, CA, 92274
Phone: (760) 399 - 0022
Fax: (760) 397-8146
mmirelez@tmdci.org

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Silver Beach Grand Residential Development Project, Riverside County.

APPENDIX D – HYDROLOGY REPORT

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May 2023

PRELIMINARY HYDROLOGY REPORT

For
Tentative Tract Map 38066
VALLE RESEDA

City of San Jacinto

County of Riverside, CA

Prepared For:

CAMELLIA HOMES

8201 Grand
Huntington Beach, CA 92646

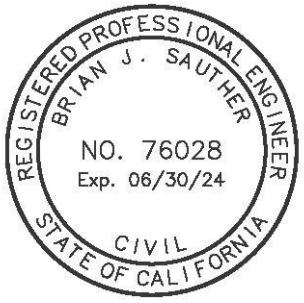
Phone (858) 997-7973

Prepared By:

HUNSAKER & ASSOCIATES IRVINE, INC.
Three Hughes, Irvine, CA 92618 | 949.583.1010

WO#: 4513-1 PHydroRpt-ValleResedaTTM38066

PRELIMINARY HYDROLOGY REPORT
FOR
TENTATIVE TRACT MAP 38066
VALLE RESEDA
CITY OF SAN JACINTO
COUNTY RIVERSIDE



PREPARED BY

Brian J Sauther

05/10/23

Brian J. Sauther, R.C.E. 76028, Exp. 06/30/24 Date:

PRELIMINARY HYDROLOGY REPORT
FOR
TENTATIVE TRACT MAP 38066
Valle Reseda
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- 2-year, 24 hr Storm
- 10-year, (1-hr, 3-hr, 6-hr, & 24-hr) Storms
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SECTION 1
DISCUSSION

A. PROJECT SITE

The Project Site TTM 38066 is located in Lot 37, T4S, R1W in the City of San Jacinto, Riverside County, California. The Project Site is located just west of N Ramona Blvd. The northern portion of the project site is bounded by Ramona Blvd to the east, Ranch View Ln to the south, and undeveloped agricultural land to west. The southern portion of the project site is completed surrounded by undeveloped agricultural land (See Figure 1 below).



Figure 1. Vicinity Map

B. PURPOSE AND SCOPE

The purpose of this study is to provide preliminary hydrology for the proposed drainage facilities for TTM 38066 and to provide preliminary sizing of the proposed flood control facilities which will provide flood protection up to 100-year frequency storm event.

The scope of this study includes the following:

- Provide rational method hydrologic calculations for the 10-year and 100-year storms for pre-project (Existing) and post-project (Proposed) conditions.

- Develop pre-project condition and post-project condition hydrographs for the 2-year, 24-hour storm, the 10-year, 1-hour, 3-hour, 6-hour, and 24-hour storms, and 100-year, 1-hour, 3-hour, 6-hour, and 24-hour storms as basis for the proposed basin designs to meet both City flood control requirements and to meet Santa Ana Water Quality Control Board Hydrologic Condition of Concern (HCOC) requirements.

- Provide Existing and Proposed condition hydrology maps (Rational Method) showing delineated drainage areas and points of discharge as a results of the rational method calculations included in this report.

The scope of this study **does not** include the following:

- Provide an explanation of the proposed water quality facilities. An explanation of the water quality facilities are included in the Project Water Quality Management Plan (WQMP) Plan.

- Provide calculations for the Design Capture Volume (DCV). Calculations for DCV are included in the Project WQMP.

- Provide proposed basin infiltration/drawdown calculations for the DCV Infiltration/drawdown calculations for DCV are included in the Project WQMP.

C. PRE-PROJECT CONDITION

The pre-project site is 100% composed of undeveloped agricultural land (see Figure 2). The project site is extremely flat with average slopes less than 1%. The site generally drains from the southeast to the northwest. Drainage generated on the project site is ultimately collected in the earthen swale located on the north side of the property. Drainage from this earthen swale is released to the off-site property to the north through openings in this swale.



Figure 2. Pre-Project Site

D. PROPOSED CONDITION

The project proposes to develop the Project Site into 206 residential Single Family Homes with all the associated infrastructure improvements such as internal roads, wet and dry utilities, concrete walkways, and landscaped areas.

Drainage from the improved site will be collected in two separate onsite storm drains systems and conveyed to two detention basins, Basin A and Basin B. Basin A will intercept drainage from the northern ¼ of the project site (Area A) and Basin B will intercept drainage from the remaining ¾ of the project site (Area B). The proposed storm drain system is shown in Figure 3.

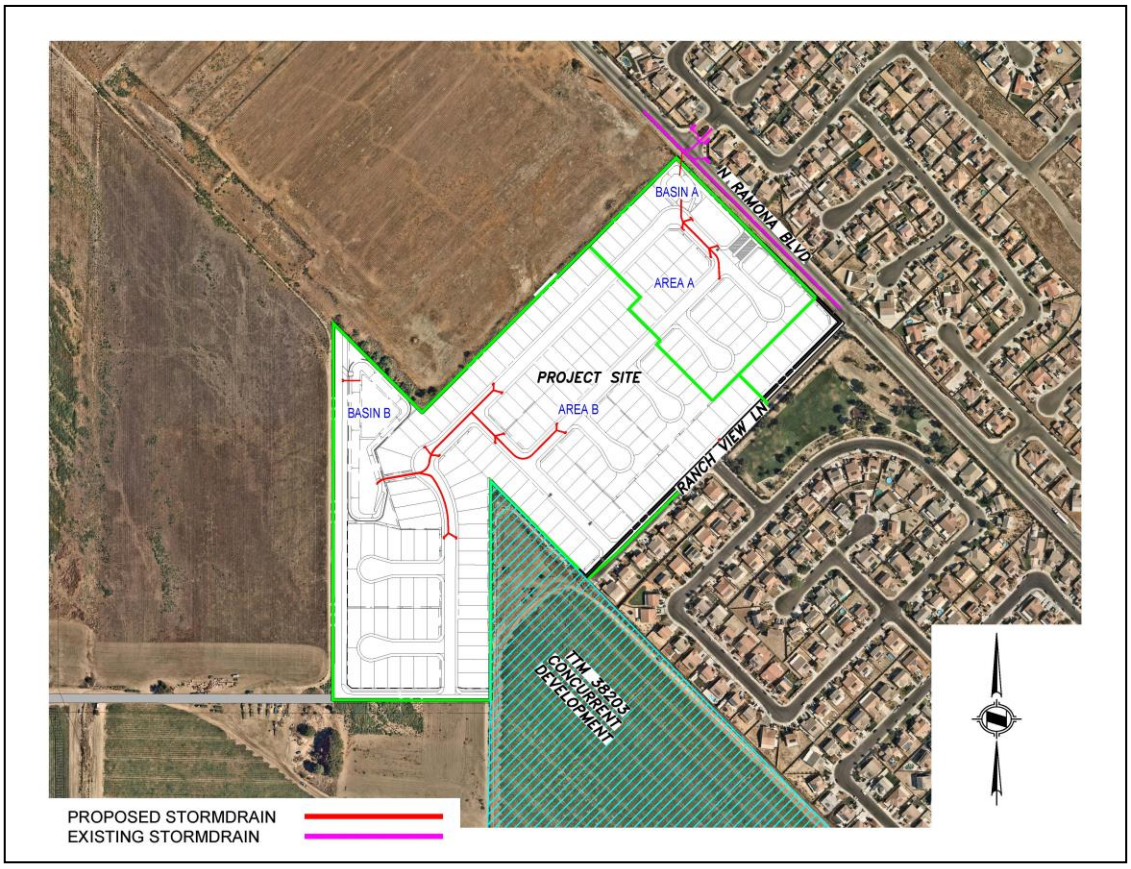


Figure 3. Proposed Site and Strom Drain System

The proposed storm drain systems will be designed to convey the 100-year peak flow generated on the Project Site to two basins, Basin A and Basin B. Basin A is to be designed as a retention basin for water quality treatment only. All flow in excess to the water quality flows will be conveyed through a basin to an outlet structure and storm drain line that will connect to an existing storm drain in Ramona Blvd. Basin B is to be designed as a retention basin with an overflow spillway. Basin B shall treat drainage per the Project WQMP, mitigate the difference in flow rate and outflow volume between the proposed and existing condition 2-year 24-hour hydrographs, and to mitigate the difference

between the proposed and existing development conditions for the 10-year and 100-year storms.

E. METHODOLOGY

The methodology used to for this hydrology study is based on the Riverside County Flood Control and Water Conservation District's (RCFC&WCD) Hydrology Manual dated April 1976. The hydrology and hydraulic software utilized are accepted by the RCFC&WCD which include the following:

Rational Method:	Hydrology – Riverside County – Civil Design Software - Version 9.0.
Unit Hydrograph:	Hydrology – Riverside County – Civil Design Software - Version 9.0.
Basin Routing:	Hydrograph Routing – Civil Design Software - Version 9.0.
Hydraulics Inlets:	Bentley FlowMaster – Bentley Systems, Inc – Version V8i.
Hydraulics Storm Drain:	WSPGW – Los Angeles County Flood Control District – Version 14.10.

The Hydrologic Soil Groups used for this study were based on the soils information shown on the National Cooperative Soil Survey (NCSS) website provided by the Natural Resource Conservation Service. The soils map provided by the website shows that the Project Site contains sandy loam soil classified in Hydrologic Soil Group B/D. The RCFC&WCD's Hydrology Manual states that in cases where a site has dual soil designation, the more conservative value is recommended for the design hydrology. A copy of the Soils Map and explanation of soil types are provided in Section 8– References.

Existing and Proposed condition land use imperviousness are based on the standard land use/imperviousness data provided on Plate E-6.3 in the RCFC&WCD Hydrology Manual. 65 percent imperviousness was used for the proposed project site and 0 percent imperviousness was used existing undeveloped property. A copy of the land use/impervious data table (Plate E-6.3) is provided in Section 8 – References.

Per RCFC&WCD requirements, the Modified Rational Method as outlined in Hydrology Manual was used to calculate the pre-project and post-project runoff peak flow generated from the Project Site. The 100-year proposed condition rational method peak flow will be used to size all storm drain lines, and all catch basins.

Per RCFC&WCD requirements, the Unit Hydrograph Method as outlined in Hydrology Manual was used to calculate both pre-project condition and post-project condition Hydrographs for Project Site. The Unit Hydrograph Method is used to size the basin and to design the basin outlet structures and overflow spillway.

F. HYDROLOGIC RESULTS

RATIONAL METHOD ANALISYS

The Rational Method Calculations for the project site are based on the methods outlined in Section D of the Hydrology Manual.

The project site was delineated into several sub-areas and longest flow path for each subarea was determined based on the existing or proposed grading. Proposed condition sub-areas were further delineated based on proposed catch basin locations. A Hydrology Map for the existing condition is available in Section 3 – Existing Condition Hydrology Rational Method Analysis. A Hydrology Map for proposed condition is available in Section 4 – Proposed Condition Hydrology Rational Method Analysis.

An imperviousness fraction (A_i) of 0% with a Hydrologic Soils Group D was used for the entire Project site in the existing condition. An imperviousness fraction (A_i) of 65% with a Hydrologic Soils Group D was used for the Project site in the proposed condition. The imperviousness fraction values and Hydrologic Soils Group information was entered into the Civil Design Software program and the results of the Rational Method calculation area summarized in the following table:

Table 1. Summary Rational Method Calculations Propose Condition

Drainage Condition	Drainage Area Name	Downstream Node #	Tributary Area (acre)	10-year Peak Flow (cfs)	100-year Peak Flow (cfs)
Existing	A	101	7.88	9.6	17.2
Proposed	A	104	7.88	12.4	21.9
Existing	B	202	30.97	34.0	60.9
Proposed	B	210	30.97	44.5	80.3
Existing	C	501	1.18	1.4	2.6
Proposed	C	501	1.18	1.9	3.4

UNIT HYDROGRAPH ANALISYS

The Unit Hydrograph Calculations for the project site are based on the methods outlined in Section E of the Hydrology Manual. Unit hydrograph method will be used to size Basin B.

Precipitation values used in the development of the unit hydrographs for the proposed and existing condition for the project site are were obtained from NOAA Atlas 14, Volume 6, Version 2. Copies of the precipitation values is available in Section 8 – References.

Lag time, area average mean soil loss rate (F), minimum soil loss rate (Fm) and low loss rate (F*) where developed using procedures shown on Plate E-1.1 of the Hydrology manual and calculated within the Civil Design Software program.

The parameters as mentioned above were entered into the Civil Design Software program and following tables summarizes the results:

Table 2. Unit Hydrographs Analysis Results for Area B (2-year, 24 hr Storm)

Condition	Tributary Area (ac)	Peak flow (CFS)	Runoff Volume (Ac-FT)
Existing	30.97	2.5	0.70
Proposed	30.97	5.9	3.20

Table 3. Unit Hydrographs Analysis Results for Area B (10 year Storm)

Condition	Tributary Area (ac)	Peak flow (CFS)	Runoff Volume (Ac-FT)	Peak flow (CFS)	Runoff Volume (Ac-FT)	Peak flow (CFS)	Runoff Volume (Ac-FT)	Peak flow (CFS)	Runoff Volume (Ac-FT)
		1-hr Storm		3-hr Storm		6-hr Storm		24-hr Storm	
Existing	30.97	48.1	2.2	30.9	2.9	27.0	3.3	11.4	4.5
Proposed	30.97	63.3	2.4	37.0	3.3	32.7	4.1	13.2	6.8

Table 4. Unit Hydrographs Analysis Results for Area B (100 year Storm)

Condition	Tributary Area (ac)	Peak flow (CFS)	Runoff Volume (Ac-FT)	Peak flow (CFS)	Runoff Volume (Ac-FT)	Peak flow (CFS)	Runoff Volume (Ac-FT)	Peak flow (CFS)	Runoff Volume (Ac-FT)
		1-hr Storm		3-hr Storm		6-hr Storm		24-hr Storm	
Existing	30.97	86.3	4.2	52.6	5.4	45.2	6.8	21.1	11.4
Proposed	30.97	110.2	4.2	60.2	5.6	52.1	7.2	22.3	12.7

The results of the from the tables above indicate that the peak flow rates and runoff volumes increased during a 2-year, 10-year, and 100-year storms for the proposed project as compared to the existing condition; therefore, mitigation measures well be necessary for the project to meet flood control and HCOC requirements.

G. STORM WATER PEAK FLOW AND RUNOFF VOLUME MITIGATION AREA B

In order to mitigate the increase peak flow and runoff volume generated on the site due to proposed development for areas tributary to Basin B, the project proposes to construct a 9.5 ac-ft retention basin. The retention basin will have overflow spillway which will be set 1.5 below the top of the proposed basin. Stage-storage calculations for Basin B are available in Section 6 – Hydrograph Analysis Basin B.

Per the stage storage-calculation provided, the proposed basin has a storage volume of 7.3 ac-ft below the crest of the overflow spillway. This storage volume below the spillway crest exceeds the proposed condition runoff volume for all above analyzed design storms except the 100-year, 24-hr storm. Therefore, the peak flow discharged over the proposed spillway for these design storms is equal to zero.

For the 100-year, 24-hr storm (Proposed Condition), the peak flow discharged from the spillway can be determined by a graphical analysis of the unit hydrograph. This graphical analysis is shown on Exhibit 1 in Section 6 – Hydrograph Analysis Basin B. The analysis indicates the 100-year, 24-hr peak flow of 21.0 CFS is reduced to 16.4 CFS after filling the basin and discharging though the basin spillway.

H. STORM WATER PEAK FLOW BASIN A

For the areas tributary to Basin A, the peak flow was determined to equal 21.9 cfs for the 100-year storm (Rational Method Analysis). Basin A is to be designed to include and outlet structure that will bypass all flows above the water quality flows to a 24” RCP outlet pipe that is to be connect to the existing City storm drain in facility (Line E) in Ramona Blvd.

To determine that effects of adding additional flow to Line E from the proposed project site, a Water Surface Pressure Gradient (WSPG) hydraulic model for Line E was created from as-built drawings. The additional flow from Area A (Basin A) and Area C was added to the model to determine the possible negative impacts to the storm drain in Ramona

Blvd. The results of this hydraulic model for Line E are available in Section 7 – WSPG Model Line E.

The results of the model indicate the 100-year hydraulic grade line increases no more than a maximum of 0.8 ft at any of the existing storm drain lateral connections and that proposed hydraulic grade in Line E is at least 1 ft below the finished grade of Ramona Blvd throughout the entire model.

I. CONCLUSION

The proposed storm drain systems and retention basin systems will provide adequate flood control protection for the proposed development. The proposed storm drain system with the proposed retention basin system will mitigate impacts to existing flood control facilities per agency requirements.

SECTION 2
EXITING CONDITION HYDROLOGY
RATIONAL METHOD ANALYSIS

10 – YEAR STORM

AREA A

```
                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 05/09/23  File:vaex10.out
------------------------------------------------------------------------
Tr 38066 Valle Reseda
Rational Method
Existing Condition (Area A)
5/9/23
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation =  0.486(In.)
100 year, 1 hour precipitation =  1.650(In.)

Storm event year =  10.0
Calculated rainfall intensity data:
1 hour intensity =  0.965(In/Hr)
Slope of intensity duration curve = 0.4300




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      100.000 to Point/Station      101.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   743.000(Ft.)
Top (of initial area) elevation =  1473.700(Ft.)
Bottom (of initial area) elevation =  1469.700(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00538  s(percent)=       0.54
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   21.206 min.
Rainfall intensity =      1.509(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.811
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  89.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      9.648(CFS)

Total initial stream area =        7.880(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            7.88 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  89.0
```

AREA B

```
                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 05/09/23  File:vbex10.out
------------------------------------------------------------------------
Tr 38066 Valle Reseda
Rational Method
Existing Condition (Area B)
5/9/23
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation =  0.486(In.)
100 year, 1 hour precipitation =  1.650(In.)

Storm event year =  10.0
Calculated rainfall intensity data:
1 hour intensity =  0.965(In/Hr)
Slope of intensity duration curve = 0.4300




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      200.000 to Point/Station      201.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   895.500(Ft.)
Top (of initial area) elevation =  1473.000(Ft.)
Bottom (of initial area) elevation =  1469.000(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00447  s(percent)=       0.45
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   23.719 min.
Rainfall intensity =      1.438(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.807
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  89.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      7.803(CFS)
Total initial stream area =        6.720(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      202.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1469.000(Ft.)
End of natural channel elevation =   1466.000(Ft.)
Length of natural channel  =   728.200(Ft.)
Estimated mean flow rate at midpoint of channel =     21.883(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   1.97(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
        Normal channel slope =  0.0041
Corrected/adjusted channel slope =  0.0041
Travel time =    6.16 min.     TC =   29.88  min.


 Adding area flow to channel
USER INPUT of soil data for subarea
Runoff Coefficient = 0.830
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  92.00
Pervious area fraction =  0.950; Impervious fraction =  0.050
Rainfall intensity =      1.302(In/Hr) for a    10.0 year storm
Subarea runoff =     26.213(CFS) for     24.250(Ac.)
Total runoff =     34.016(CFS)    Total area =      30.970(Ac.)
End of computations, total study area =           30.97 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.961
Area averaged RI index number =  91.3
```

100 – YEAR STORM

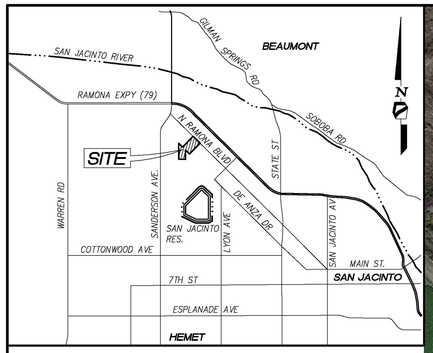
AREA A

```
                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 05/09/23  File:vaex100.out
------------------------------------------------------------------------
Tr 38066 Valle Reseda
Rational Method
Existing Condition (Area A)
5/9/23
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =  100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation =  0.486(In.)
100 year, 1 hour precipitation =  1.650(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.650(In/Hr)
Slope of intensity duration curve = 0.4300




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      100.000 to Point/Station      101.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   743.000(Ft.)
Top (of initial area) elevation =  1473.700(Ft.)
Bottom (of initial area) elevation =  1469.700(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00538  s(percent)=       0.54
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   21.206 min.
Rainfall intensity =      2.581(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.846
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  89.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =     17.203(CFS)

Total initial stream area =        7.880(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            7.88 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  89.0
```

AREA B

```
                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 05/09/23  File:vbex100.out
------------------------------------------------------------------------
Tr 38066 Valle Reseda
Rational Method
Existing Condition (Area B)
5/9/23
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =  100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation =  0.486(In.)
100 year, 1 hour precipitation =  1.650(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.650(In/Hr)
Slope of intensity duration curve = 0.4300




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      200.000 to Point/Station      201.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   895.500(Ft.)
Top (of initial area) elevation =  1473.000(Ft.)
Bottom (of initial area) elevation =  1469.000(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00447  s(percent)=       0.45
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   23.719 min.
Rainfall intensity =      2.459(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.843
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  89.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =     13.939(CFS)
Total initial stream area =        6.720(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      202.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1469.000(Ft.)
End of natural channel elevation =   1466.000(Ft.)
Length of natural channel  =   728.200(Ft.)
Estimated mean flow rate at midpoint of channel =     39.090(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   2.32(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
        Normal channel slope =  0.0041
Corrected/adjusted channel slope =  0.0041
Travel time =    5.24 min.     TC =   28.96  min.


 Adding area flow to channel
USER INPUT of soil data for subarea
Runoff Coefficient = 0.858
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  92.00
Pervious area fraction =  0.950; Impervious fraction =  0.050
Rainfall intensity =      2.257(In/Hr) for a   100.0 year storm
Subarea runoff =     46.970(CFS) for     24.250(Ac.)
Total runoff =     60.909(CFS)    Total area =      30.970(Ac.)
End of computations, total study area =           30.97 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.961
Area averaged RI index number =  91.3
```

HYDROLOGY MAP



VICINITY MAP

N.T.S.

LEGEND

- D / 3.0 — AREA / ACREAGE
- MAJOR DRAINAGE AREA BOUNDARY
- SUBAREA DRAINAGE BOUNDARY
- PROPOSED STORM DRAIN
- FLOW LINE (SURFACE FLOW)
- ● 1 — NODE & NODE #

DATE PREPARED: 07-21-2022

PREPARED BY:

HUNSAKER & ASSOCIATES
IRVINE, INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
Three Hughes ▪ Irvine, CA 92618 ▪ PH: (949) 583-1010 ▪ FX: (949) 583-0759

0 40 80 160 240 320

SCALE: 1" = 80'

HYDROLOGY MAP
EXISTING CONDITION
VALLE RESEDA
TR 38066
RIVERSIDE CO, CA

PLOTTED BY: Brian Sauther DATE: May. 10, 2023 01:42:26 PM FILE: F:\1244\Engineering\SY_Hydrology\Hydrology Map-EX-2023-0509.dwg

SECTION 3
PROPOSED CONDITION HYDROLOGY
RATIONAL METHOD ANALYSIS

10 – YEAR STORM

AREA A

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                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 05/05/23  File:vapro10.out
------------------------------------------------------------------------
Tr 38066 Valle Reseda
Rational Method
Proposed Condition (Area A)
5/5/23
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation =  0.486(In.)
100 year, 1 hour precipitation =  1.650(In.)

Storm event year =  10.0
Calculated rainfall intensity data:
1 hour intensity =  0.965(In/Hr)
Slope of intensity duration curve = 0.4300




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      100.000 to Point/Station      101.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   565.200(Ft.)
Top (of initial area) elevation =  1476.900(Ft.)
Bottom (of initial area) elevation =  1472.100(Ft.)
Difference in elevation =     4.800(Ft.)
Slope =    0.00849  s(percent)=       0.85
TC = k(0.370)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.114 min.
Rainfall intensity =      1.920(In/Hr) for a    10.0 year storm
CONDOMINIUM subarea type
Runoff Coefficient = 0.841
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Initial subarea runoff =      6.069(CFS)
Total initial stream area =        3.760(Ac.)
Pervious area fraction = 0.350


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1468.800(Ft.)
Downstream point/station elevation =  1468.300(Ft.)
Pipe length  =   118.40(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.069(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     6.069(CFS)
Normal flow depth in pipe =   13.22(In.)
Flow top width inside pipe =   15.90(In.)
Critical Depth =   11.42(In.)
Pipe flow velocity =      4.36(Ft/s)
Travel time through pipe =    0.45 min.
Time of concentration (TC) =    12.57 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      102.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.840
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    12.57 min.
Rainfall intensity =      1.890(In/Hr) for a    10.0 year storm
Subarea runoff =      1.619(CFS) for      1.020(Ac.)
Total runoff =      7.689(CFS)    Total area =       4.780(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      102.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.883
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    12.57 min.
Rainfall intensity =      1.890(In/Hr) for a    10.0 year storm
Subarea runoff =      0.250(CFS) for      0.150(Ac.)
Total runoff =      7.939(CFS)    Total area =       4.930(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
```

```
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =  1468.300(Ft.)
Downstream point/station elevation =  1467.600(Ft.)
Pipe length  =   131.20(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.939(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     7.939(CFS)
Normal flow depth in pipe =   12.77(In.)
Flow top width inside pipe =   20.50(In.)
Critical Depth =   12.53(In.)
Pipe flow velocity =      5.18(Ft/s)
Travel time through pipe =    0.42 min.
Time of concentration (TC) =    12.99 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      103.000
**** SUBAREA FLOW ADDITION ****
_____________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.839
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    12.99 min.
Rainfall intensity =      1.863(In/Hr) for a    10.0 year storm
Subarea runoff =      1.470(CFS) for      0.940(Ac.)
Total runoff =      9.409(CFS)    Total area =       5.870(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      103.000
**** SUBAREA FLOW ADDITION ****
_____________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.839
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    12.99 min.
Rainfall intensity =      1.863(In/Hr) for a    10.0 year storm
Subarea runoff =      1.689(CFS) for      1.080(Ac.)
Total runoff =     11.098(CFS)    Total area =       6.950(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =  1467.600(Ft.)
Downstream point/station elevation =  1467.200(Ft.)
Pipe length  =    79.50(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.098(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    11.098(CFS)
Normal flow depth in pipe =   16.97(In.)
Flow top width inside pipe =   16.54(In.)
Critical Depth =   14.90(In.)
Pipe flow velocity =      5.33(Ft/s)
Travel time through pipe =    0.25 min.
Time of concentration (TC) =    13.24 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      104.000
**** SUBAREA FLOW ADDITION ****
_____________________________________________________________________
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.762
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  80.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    13.24 min.
Rainfall intensity =      1.848(In/Hr) for a    10.0 year storm
Subarea runoff =      1.310(CFS) for      0.930(Ac.)
Total runoff =     12.408(CFS)    Total area =       7.880(Ac.)
End of computations, total study area =            7.88 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.422
Area averaged RI index number =  75.6
```

AREA B

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 05/05/23 File:vbpro10.out

Tr 38066 Valle Reseda
Rational Method
Proposed Condition (Area B)
5/5/23

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6406

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.486(In.)
100 year, 1 hour precipitation = 1.650(In.)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.965(In/Hr)
Slope of intensity duration curve = 0.4300

++
Process from Point/Station 200.000 to Point/Station 201.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 310.900(Ft.)
Top (of initial area) elevation = 1479.100(Ft.)
Bottom (of initial area) elevation = 1476.000(Ft.)
Difference in elevation = 3.100(Ft.)
Slope = 0.00997 s(percent)= 1.00
TC = k(0.370)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 9.236 min.
Rainfall intensity = 2.157(In/Hr) for a 10.0 year storm
CONDOMINIUM subarea type
Runoff Coefficient = 0.846
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2) = 75.00
Pervious area fraction = 0.350; Impervious fraction = 0.650
Initial subarea runoff = 2.081(CFS)
Total initial stream area = 1.140(Ac.)
Pervious area fraction = 0.350

++
Process from Point/Station 201.000 to Point/Station 202.000
**** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 1476.000(Ft.)
Downstream point elevation = 1474.300(Ft.)
Channel length thru subarea = 112.200(Ft.)
Channel base width = 3.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.015
Maximum depth of channel = 1.500(Ft.)
Flow(q) thru subarea = 2.081(CFS)
Depth of flow = 0.176(Ft.), Average velocity = 3.529(Ft/s)
Channel flow top width = 3.704(Ft.)
Flow Velocity = 3.53(Ft/s)
Travel time = 0.53 min.
Time of concentration = 9.77 min.

Sub-Channel No. 1 Critical depth = 0.234(Ft.)
' ' ' Critical flow top width = 3.938(Ft.)
' ' ' Critical flow velocity= 2.560(Ft/s)
' ' ' Critical flow area = 0.813(Sq.Ft)

++
Process from Point/Station 202.000 to Point/Station 203.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 1474.300(Ft.)
End of street segment elevation = 1471.300(Ft.)
Length of street segment = 581.300(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 20.000(Ft.)
Distance from crown to crossfall grade break = 5.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 0.020
Gutter width = 1.500(Ft.)
Gutter hike from flowline = 1.000(In.)
Manning's N in gutter = 0.0150
Manning's N from gutter to grade break = 0.0150
Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 4.887(CFS)
Depth of flow = 0.361(Ft.), Average velocity = 2.033(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 15.374(Ft.)
Flow velocity = 2.03(Ft/s)
Travel time = 4.77 min. TC = 14.53 min.
Adding area flow to street
CONDOMINIUM subarea type
Runoff Coefficient = 0.837
Decimal fraction soil group A = 0.000

```
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Rainfall intensity =      1.775(In/Hr) for a    10.0 year storm
Subarea runoff =      5.527(CFS) for      3.720(Ac.)
Total runoff =      7.608(CFS)    Total area =       4.860(Ac.)
Street flow at end of street =      7.608(CFS)
Half street flow at end of street =      7.608(CFS)
Depth of flow =   0.417(Ft.), Average velocity =   2.269(Ft/s)
Flow width (from curb towards crown)=  18.202(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      203.000 to Point/Station      204.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1466.270(Ft.)
Downstream point/station elevation =  1466.200(Ft.)
Pipe length  =    30.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.608(CFS)
Given pipe size =     18.00(In.)
NOTE: Normal flow is pressure flow in user selected pipe size.
The approximate hydraulic grade line above the pipe invert is
     0.519(Ft.)  at the headworks or inlet of the pipe(s)
 Pipe friction loss =      0.157(Ft.)
 Minor friction loss =      0.432(Ft.)     K-factor =   1.50
Pipe flow velocity =      4.31(Ft/s)
Travel time through pipe =    0.12 min.
Time of concentration (TC) =    14.65 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      204.000 to Point/Station      204.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.837
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    14.65 min.
Rainfall intensity =      1.769(In/Hr) for a    10.0 year storm
Subarea runoff =      2.487(CFS) for      1.680(Ac.)
Total runoff =     10.096(CFS)    Total area =       6.540(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      204.000 to Point/Station      204.500
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1466.200(Ft.)
Downstream point/station elevation =  1465.600(Ft.)
Pipe length  =   193.20(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.096(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    10.096(CFS)
Normal flow depth in pipe =   16.24(In.)
Flow top width inside pipe =   22.45(In.)
Critical Depth =   13.63(In.)
Pipe flow velocity =      4.46(Ft/s)
Travel time through pipe =    0.72 min.
Time of concentration (TC) =    15.37 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      204.500 to Point/Station      204.500
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.836
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    15.37 min.
Rainfall intensity =      1.733(In/Hr) for a    10.0 year storm
Subarea runoff =      2.650(CFS) for      1.830(Ac.)
Total runoff =     12.746(CFS)    Total area =       8.370(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      204.500 to Point/Station      205.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1465.600(Ft.)
Downstream point/station elevation =  1465.300(Ft.)
Pipe length  =    97.50(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.746(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    12.746(CFS)
Normal flow depth in pipe =   20.02(In.)
Flow top width inside pipe =   17.86(In.)
Critical Depth =   15.39(In.)
Pipe flow velocity =      4.55(Ft/s)
Travel time through pipe =    0.36 min.
Time of concentration (TC) =    15.73 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      205.000 to Point/Station      205.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.835
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    15.73 min.
Rainfall intensity =      1.716(In/Hr) for a    10.0 year storm
Subarea runoff =      3.411(CFS) for      2.380(Ac.)
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Total runoff =     16.157(CFS)    Total area =      10.750(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      205.000 to Point/Station      205.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.835
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    15.73 min.
Rainfall intensity =      1.716(In/Hr) for a    10.0 year storm
Subarea runoff =      2.537(CFS) for      1.770(Ac.)
Total runoff =     18.694(CFS)    Total area =      12.520(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      205.000 to Point/Station      206.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1465.300(Ft.)
Downstream point/station elevation =  1465.000(Ft.)
Pipe length  =   119.40(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    18.694(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    18.694(CFS)
Normal flow depth in pipe =   22.45(In.)
Flow top width inside pipe =   26.03(In.)
Critical Depth =   17.60(In.)
Pipe flow velocity =      4.75(Ft/s)
Travel time through pipe =    0.42 min.
Time of concentration (TC) =    16.15 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      206.000 to Point/Station      206.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     12.520(Ac.)
Runoff from this stream =     18.694(CFS)
Time of concentration =   16.15 min.
Rainfall intensity =     1.697(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      301.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   680.800(Ft.)
Top (of initial area) elevation =  1475.400(Ft.)
Bottom (of initial area) elevation =  1470.000(Ft.)
Difference in elevation =     5.400(Ft.)
Slope =    0.00793  s(percent)=       0.79
TC = k(0.370)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.229 min.
Rainfall intensity =      1.848(In/Hr) for a    10.0 year storm
CONDOMINIUM subarea type
Runoff Coefficient = 0.839
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Initial subarea runoff =      3.226(CFS)
Total initial stream area =        2.080(Ac.)
Pervious area fraction = 0.350


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1465.700(Ft.)
Downstream point/station elevation =  1465.600(Ft.)
Pipe length  =    30.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.226(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     3.226(CFS)
Normal flow depth in pipe =   10.77(In.)
Flow top width inside pipe =   13.50(In.)
Critical Depth =    8.68(In.)
Pipe flow velocity =      3.42(Ft/s)
Travel time through pipe =    0.15 min.
Time of concentration (TC) =    13.38 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      302.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.839
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    13.38 min.
Rainfall intensity =      1.840(In/Hr) for a    10.0 year storm
Subarea runoff =      2.731(CFS) for      1.770(Ac.)
Total runoff =      5.957(CFS)    Total area =       3.850(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      206.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1465.600(Ft.)
Downstream point/station elevation =  1465.000(Ft.)
Pipe length  =   111.10(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.957(CFS)
Nearest computed pipe diameter  =     18.00(In.)
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Calculated individual pipe flow  =     5.957(CFS)
Normal flow depth in pipe =   11.86(In.)
Flow top width inside pipe =   17.07(In.)
Critical Depth =   11.32(In.)
Pipe flow velocity =      4.82(Ft/s)
Travel time through pipe =    0.38 min.
Time of concentration (TC) =    13.76 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      206.000 to Point/Station      206.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      3.850(Ac.)
Runoff from this stream =      5.957(CFS)
Time of concentration =   13.76 min.
Rainfall intensity =     1.818(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       18.694     16.15                1.697
2        5.957     13.76                1.818
Largest stream flow has longer time of concentration
Qp =     18.694 + sum of
           Qb         Ia/Ib
            5.957 *    0.934 =      5.561
Qp =     24.255

Total of 2 streams to confluence:
Flow rates before confluence point:
      18.694       5.957
Area of streams before confluence:
       12.520        3.850
Results of confluence:
Total flow rate =     24.255(CFS)
Time of concentration =    16.146 min.
Effective stream area after confluence =     16.370(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      206.000 to Point/Station      207.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1465.000(Ft.)
Downstream point/station elevation =  1464.300(Ft.)
Pipe length  =   209.30(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    24.255(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    24.255(CFS)
Normal flow depth in pipe =   25.22(In.)
Flow top width inside pipe =   21.96(In.)
Critical Depth =   20.13(In.)
Pipe flow velocity =      5.50(Ft/s)
Travel time through pipe =    0.63 min.
Time of concentration (TC) =    16.78 min.


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Process from Point/Station      207.000 to Point/Station      207.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.834
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    16.78 min.
Rainfall intensity =      1.669(In/Hr) for a    10.0 year storm
Subarea runoff =      3.131(CFS) for      2.250(Ac.)
Total runoff =     27.386(CFS)    Total area =      18.620(Ac.)


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Process from Point/Station      207.000 to Point/Station      207.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.834
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    16.78 min.
Rainfall intensity =      1.669(In/Hr) for a    10.0 year storm
Subarea runoff =      1.544(CFS) for      1.110(Ac.)
Total runoff =     28.930(CFS)    Total area =      19.730(Ac.)


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Process from Point/Station      207.000 to Point/Station      208.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1464.300(Ft.)
Downstream point/station elevation =  1464.100(Ft.)
Pipe length  =    84.20(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    28.930(CFS)
Nearest computed pipe diameter  =     36.00(In.)
Calculated individual pipe flow  =    28.930(CFS)
Normal flow depth in pipe =   26.44(In.)
Flow top width inside pipe =   31.80(In.)
Critical Depth =   20.90(In.)
Pipe flow velocity =      5.20(Ft/s)
Travel time through pipe =    0.27 min.
Time of concentration (TC) =    17.05 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      208.000 to Point/Station      208.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
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Stream flow area =     19.730(Ac.)
Runoff from this stream =     28.930(CFS)
Time of concentration =   17.05 min.
Rainfall intensity =     1.657(In/Hr)


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Process from Point/Station      400.000 to Point/Station      401.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Initial area flow distance =   859.000(Ft.)
Top (of initial area) elevation =  1477.100(Ft.)
Bottom (of initial area) elevation =  1470.700(Ft.)
Difference in elevation =     6.400(Ft.)
Slope =    0.00745  s(percent)=       0.75
TC = k(0.370)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.701 min.
Rainfall intensity =      1.766(In/Hr) for a    10.0 year storm
CONDOMINIUM subarea type
Runoff Coefficient = 0.837
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Initial subarea runoff =      7.227(CFS)
Total initial stream area =        4.890(Ac.)
Pervious area fraction = 0.350


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      401.000 to Point/Station      402.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1466.500(Ft.)
Downstream point/station elevation =  1465.400(Ft.)
Pipe length  =    20.50(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.227(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     7.227(CFS)
Normal flow depth in pipe =    8.70(In.)
Flow top width inside pipe =   10.72(In.)
Critical depth could not be calculated.
Pipe flow velocity =     11.85(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =    14.73 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      402.000 to Point/Station      402.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------
CONDOMINIUM subarea type
Runoff Coefficient = 0.837
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    14.73 min.
Rainfall intensity =      1.765(In/Hr) for a    10.0 year storm
Subarea runoff =      3.012(CFS) for      2.040(Ac.)
Total runoff =     10.240(CFS)    Total area =       6.930(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      402.000 to Point/Station      208.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1465.400(Ft.)
Downstream point/station elevation =  1464.100(Ft.)
Pipe length  =   262.10(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.240(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    10.240(CFS)
Normal flow depth in pipe =   15.84(In.)
Flow top width inside pipe =   18.08(In.)
Critical Depth =   14.29(In.)
Pipe flow velocity =      5.26(Ft/s)
Travel time through pipe =    0.83 min.
Time of concentration (TC) =    15.56 min.


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Process from Point/Station      208.000 to Point/Station      208.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      6.930(Ac.)
Runoff from this stream =     10.240(CFS)
Time of concentration =   15.56 min.
Rainfall intensity =     1.724(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       28.930     17.05                 1.657
2       10.240     15.56                 1.724
Largest stream flow has longer time of concentration
Qp =     28.930 + sum of
           Qb         Ia/Ib
           10.240 *    0.961 =      9.845
Qp =     38.775

Total of 2 streams to confluence:
Flow rates before confluence point:
      28.930      10.240
Area of streams before confluence:
       19.730        6.930
Results of confluence:
Total flow rate =     38.775(CFS)
Time of concentration =    17.050 min.
Effective stream area after confluence =     26.660(Ac.)


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Process from Point/Station      208.000 to Point/Station      209.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1464.100(Ft.)
Downstream point/station elevation =  1463.600(Ft.)
Pipe length  =   156.50(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    38.775(CFS)
Nearest computed pipe diameter  =     36.00(In.)
Calculated individual pipe flow  =    38.775(CFS)
Normal flow depth in pipe =   30.56(In.)
Flow top width inside pipe =   25.78(In.)
Critical Depth =   24.33(In.)
Pipe flow velocity =      6.07(Ft/s)
Travel time through pipe =    0.43 min.
Time of concentration (TC) =    17.48 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      209.000 to Point/Station      210.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.748
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  80.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    17.48 min.
Rainfall intensity =      1.640(In/Hr) for a    10.0 year storm
Subarea runoff =      2.711(CFS) for      2.210(Ac.)
Total runoff =     41.486(CFS)    Total area =      28.870(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      210.000 to Point/Station      210.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
Runoff Coefficient = 0.881
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    17.48 min.
Rainfall intensity =      1.640(In/Hr) for a    10.0 year storm
Subarea runoff =      3.033(CFS) for      2.100(Ac.)
Total runoff =     44.519(CFS)    Total area =      30.970(Ac.)
End of computations, total study area =           30.97 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.379
Area averaged RI index number =  75.4
```

AREA C

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                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 05/05/23  File:vcpro10.out
------------------------------------------------------------------------
Tr 38066 Valle Reseda
Rational Method
Proposed Condition (Area C)
5/5/23
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation =  0.486(In.)
100 year, 1 hour precipitation =  1.650(In.)

Storm event year =  10.0
Calculated rainfall intensity data:
1 hour intensity =  0.965(In/Hr)
Slope of intensity duration curve = 0.4300




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Process from Point/Station      500.000 to Point/Station      501.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   491.100(Ft.)
Top (of initial area) elevation =  1479.100(Ft.)
Bottom (of initial area) elevation =  1475.100(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00814  s(percent)=       0.81
TC = k(0.370)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.548 min.
Rainfall intensity =      1.960(In/Hr) for a    10.0 year storm
CONDOMINIUM subarea type
Runoff Coefficient = 0.842
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Initial subarea runoff =      1.947(CFS)
Total initial stream area =        1.180(Ac.)
Pervious area fraction = 0.350
End of computations, total study area =            1.18 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.350
Area averaged RI index number =  75.0
```

100 – YEAR STORM

AREA A

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                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 05/05/23  File:vapro100.out
------------------------------------------------------------------------
Tr 38066 Valle Reseda
Rational Method
Proposed Condition (Area A)
5/5/23
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =  100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation =  0.486(In.)
100 year, 1 hour precipitation =  1.650(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.650(In/Hr)
Slope of intensity duration curve = 0.4300




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Process from Point/Station      100.000 to Point/Station      101.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   565.200(Ft.)
Top (of initial area) elevation =  1476.900(Ft.)
Bottom (of initial area) elevation =  1472.100(Ft.)
Difference in elevation =     4.800(Ft.)
Slope =    0.00849  s(percent)=       0.85
TC = k(0.370)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.114 min.
Rainfall intensity =      3.283(In/Hr) for a   100.0 year storm
CONDOMINIUM subarea type
Runoff Coefficient = 0.862
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Initial subarea runoff =     10.646(CFS)
Total initial stream area =        3.760(Ac.)
Pervious area fraction = 0.350


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1468.800(Ft.)
Downstream point/station elevation =  1468.300(Ft.)
Pipe length  =   118.40(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.646(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    10.646(CFS)
Normal flow depth in pipe =   17.95(In.)
Flow top width inside pipe =   14.79(In.)
Critical Depth =   14.59(In.)
Pipe flow velocity =      4.87(Ft/s)
Travel time through pipe =    0.41 min.
Time of concentration (TC) =    12.52 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      102.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.862
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    12.52 min.
Rainfall intensity =      3.237(In/Hr) for a   100.0 year storm
Subarea runoff =      2.846(CFS) for      1.020(Ac.)
Total runoff =     13.492(CFS)    Total area =       4.780(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      102.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.889
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    12.52 min.
Rainfall intensity =      3.237(In/Hr) for a   100.0 year storm
Subarea runoff =      0.432(CFS) for      0.150(Ac.)
Total runoff =     13.924(CFS)    Total area =       4.930(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
```

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**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =  1468.300(Ft.)
Downstream point/station elevation =  1467.600(Ft.)
Pipe length  =   131.20(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    13.924(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    13.924(CFS)
Normal flow depth in pipe =   16.88(In.)
Flow top width inside pipe =   21.93(In.)
Critical Depth =   16.13(In.)
Pipe flow velocity =      5.90(Ft/s)
Travel time through pipe =    0.37 min.
Time of concentration (TC) =    12.89 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      103.000
**** SUBAREA FLOW ADDITION ****
_____________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.862
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    12.89 min.
Rainfall intensity =      3.197(In/Hr) for a   100.0 year storm
Subarea runoff =      2.589(CFS) for      0.940(Ac.)
Total runoff =     16.513(CFS)    Total area =       5.870(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      103.000
**** SUBAREA FLOW ADDITION ****
_____________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.862
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    12.89 min.
Rainfall intensity =      3.197(In/Hr) for a   100.0 year storm
Subarea runoff =      2.974(CFS) for      1.080(Ac.)
Total runoff =     19.487(CFS)    Total area =       6.950(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =  1467.600(Ft.)
Downstream point/station elevation =  1467.200(Ft.)
Pipe length  =    79.50(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    19.487(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    19.487(CFS)
Normal flow depth in pipe =   19.78(In.)
Flow top width inside pipe =   23.90(In.)
Critical Depth =   18.54(In.)
Pipe flow velocity =      6.24(Ft/s)
Travel time through pipe =    0.21 min.
Time of concentration (TC) =    13.10 min.


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Process from Point/Station      104.000 to Point/Station      104.000
**** SUBAREA FLOW ADDITION ****
_____________________________________________________________________
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.814
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  80.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    13.10 min.
Rainfall intensity =      3.174(In/Hr) for a   100.0 year storm
Subarea runoff =      2.404(CFS) for      0.930(Ac.)
Total runoff =     21.891(CFS)    Total area =       7.880(Ac.)
End of computations, total study area =            7.88 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.422
Area averaged RI index number =  75.6
```

AREA B

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 05/05/23 File:vbpro100.out

Tr 38066 Valle Reseda
Rational Method
Proposed Condition (Area B)
5/5/23

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6406

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.486(In.)
100 year, 1 hour precipitation = 1.650(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.650(In/Hr)
Slope of intensity duration curve = 0.4300

++
Process from Point/Station 200.000 to Point/Station 201.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 310.900(Ft.)
Top (of initial area) elevation = 1479.100(Ft.)
Bottom (of initial area) elevation = 1476.000(Ft.)
Difference in elevation = 3.100(Ft.)
Slope = 0.00997 s(percent)= 1.00
TC = k(0.370)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 9.236 min.
Rainfall intensity = 3.689(In/Hr) for a 100.0 year storm
CONDOMINIUM subarea type
Runoff Coefficient = 0.866
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2) = 75.00
Pervious area fraction = 0.350; Impervious fraction = 0.650
Initial subarea runoff = 3.643(CFS)
Total initial stream area = 1.140(Ac.)
Pervious area fraction = 0.350

++
Process from Point/Station 201.000 to Point/Station 202.000
**** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 1476.000(Ft.)
Downstream point elevation = 1474.300(Ft.)
Channel length thru subarea = 112.200(Ft.)
Channel base width = 3.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.015
Maximum depth of channel = 1.500(Ft.)
Flow(q) thru subarea = 3.643(CFS)
Depth of flow = 0.244(Ft.), Average velocity = 4.281(Ft/s)
Channel flow top width = 3.976(Ft.)
Flow Velocity = 4.28(Ft/s)
Travel time = 0.44 min.
Time of concentration = 9.67 min.

Sub-Channel No. 1 Critical depth = 0.332(Ft.)
' ' ' Critical flow top width = 4.328(Ft.)
' ' ' Critical flow velocity= 2.994(Ft/s)
' ' ' Critical flow area = 1.217(Sq.Ft)

++
Process from Point/Station 202.000 to Point/Station 203.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 1474.300(Ft.)
End of street segment elevation = 1471.300(Ft.)
Length of street segment = 581.300(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 20.000(Ft.)
Distance from crown to crossfall grade break = 5.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 0.020
Gutter width = 1.500(Ft.)
Gutter hike from flowline = 1.000(In.)
Manning's N in gutter = 0.0150
Manning's N from gutter to grade break = 0.0150
Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 8.642(CFS)
Depth of flow = 0.435(Ft.), Average velocity = 2.342(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 19.105(Ft.)
Flow velocity = 2.34(Ft/s)
Travel time = 4.14 min. TC = 13.81 min.
Adding area flow to street
CONDOMINIUM subarea type
Runoff Coefficient = 0.861
Decimal fraction soil group A = 0.000

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Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Rainfall intensity =      3.103(In/Hr) for a   100.0 year storm
Subarea runoff =      9.934(CFS) for      3.720(Ac.)
Total runoff =     13.577(CFS)    Total area =       4.860(Ac.)
Street flow at end of street =     13.577(CFS)
Half street flow at end of street =     13.577(CFS)
Depth of flow =   0.498(Ft.), Average velocity =   2.753(Ft/s)
Note:  depth of flow exceeds top of street crown.
Flow width (from curb towards crown)=  20.000(Ft.)


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Process from Point/Station      203.000 to Point/Station      204.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1466.270(Ft.)
Downstream point/station elevation =  1466.200(Ft.)
Pipe length  =    30.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    13.577(CFS)
Given pipe size =     18.00(In.)
NOTE: Normal flow is pressure flow in user selected pipe size.
The approximate hydraulic grade line above the pipe invert is
     1.806(Ft.)  at the headworks or inlet of the pipe(s)
 Pipe friction loss =      0.501(Ft.)
 Minor friction loss =      1.375(Ft.)     K-factor =   1.50
Pipe flow velocity =      7.68(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    13.87 min.


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Process from Point/Station      204.000 to Point/Station      204.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.860
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    13.87 min.
Rainfall intensity =      3.097(In/Hr) for a   100.0 year storm
Subarea runoff =      4.477(CFS) for      1.680(Ac.)
Total runoff =     18.053(CFS)    Total area =       6.540(Ac.)


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Process from Point/Station      204.000 to Point/Station      204.500
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1466.200(Ft.)
Downstream point/station elevation =  1465.600(Ft.)
Pipe length  =   193.20(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    18.053(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    18.053(CFS)
Normal flow depth in pipe =   23.44(In.)
Flow top width inside pipe =   18.28(In.)
Critical Depth =   17.82(In.)
Pipe flow velocity =      4.92(Ft/s)
Travel time through pipe =    0.65 min.
Time of concentration (TC) =    14.53 min.


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Process from Point/Station      204.500 to Point/Station      204.500
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.860
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    14.53 min.
Rainfall intensity =      3.036(In/Hr) for a   100.0 year storm
Subarea runoff =      4.777(CFS) for      1.830(Ac.)
Total runoff =     22.830(CFS)    Total area =       8.370(Ac.)


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Process from Point/Station      204.500 to Point/Station      205.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1465.600(Ft.)
Downstream point/station elevation =  1465.300(Ft.)
Pipe length  =    97.50(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    22.830(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    22.830(CFS)
Normal flow depth in pipe =   24.66(In.)
Flow top width inside pipe =   22.96(In.)
Critical Depth =   19.52(In.)
Pipe flow velocity =      5.28(Ft/s)
Travel time through pipe =    0.31 min.
Time of concentration (TC) =    14.84 min.


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Process from Point/Station      205.000 to Point/Station      205.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.859
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    14.84 min.
Rainfall intensity =      3.009(In/Hr) for a   100.0 year storm
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Subarea runoff =      6.155(CFS) for      2.380(Ac.)
Total runoff =     28.985(CFS)    Total area =      10.750(Ac.)


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Process from Point/Station      205.000 to Point/Station      205.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.859
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    14.84 min.
Rainfall intensity =      3.009(In/Hr) for a   100.0 year storm
Subarea runoff =      4.577(CFS) for      1.770(Ac.)
Total runoff =     33.563(CFS)    Total area =      12.520(Ac.)


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Process from Point/Station      205.000 to Point/Station      206.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1465.300(Ft.)
Downstream point/station elevation =  1465.000(Ft.)
Pipe length  =   119.40(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    33.563(CFS)
Nearest computed pipe diameter  =     36.00(In.)
Calculated individual pipe flow  =    33.563(CFS)
Normal flow depth in pipe =   29.63(In.)
Flow top width inside pipe =   27.49(In.)
Critical Depth =   22.58(In.)
Pipe flow velocity =      5.39(Ft/s)
Travel time through pipe =    0.37 min.
Time of concentration (TC) =    15.21 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      206.000 to Point/Station      206.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     12.520(Ac.)
Runoff from this stream =     33.563(CFS)
Time of concentration =   15.21 min.
Rainfall intensity =     2.977(In/Hr)


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Process from Point/Station      300.000 to Point/Station      301.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   680.800(Ft.)
Top (of initial area) elevation =  1475.400(Ft.)
Bottom (of initial area) elevation =  1470.000(Ft.)
Difference in elevation =     5.400(Ft.)
Slope =    0.00793  s(percent)=       0.79
TC = k(0.370)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.229 min.
Rainfall intensity =      3.161(In/Hr) for a   100.0 year storm
CONDOMINIUM subarea type
Runoff Coefficient = 0.861
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Initial subarea runoff =      5.662(CFS)
Total initial stream area =        2.080(Ac.)
Pervious area fraction = 0.350


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1465.700(Ft.)
Downstream point/station elevation =  1465.600(Ft.)
Pipe length  =    30.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.662(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     5.662(CFS)
Normal flow depth in pipe =   13.78(In.)
Flow top width inside pipe =   15.25(In.)
Critical Depth =   11.01(In.)
Pipe flow velocity =      3.90(Ft/s)
Travel time through pipe =    0.13 min.
Time of concentration (TC) =    13.36 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      302.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.861
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    13.36 min.
Rainfall intensity =      3.148(In/Hr) for a   100.0 year storm
Subarea runoff =      4.798(CFS) for      1.770(Ac.)
Total runoff =     10.460(CFS)    Total area =       3.850(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      206.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1465.600(Ft.)
Downstream point/station elevation =  1465.000(Ft.)
Pipe length  =   111.10(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.460(CFS)
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Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    10.460(CFS)
Normal flow depth in pipe =   15.56(In.)
Flow top width inside pipe =   18.40(In.)
Critical Depth =   14.45(In.)
Pipe flow velocity =      5.48(Ft/s)
Travel time through pipe =    0.34 min.
Time of concentration (TC) =    13.70 min.


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Process from Point/Station      206.000 to Point/Station      206.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      3.850(Ac.)
Runoff from this stream =     10.460(CFS)
Time of concentration =   13.70 min.
Rainfall intensity =     3.114(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       33.563     15.21                2.977
2       10.460     13.70                3.114
Largest stream flow has longer time of concentration
Qp =     33.563 + sum of
           Qb          Ia/Ib
           10.460 *    0.956 =     10.000
Qp =     43.562

Total of 2 streams to confluence:
Flow rates before confluence point:
      33.563      10.460
Area of streams before confluence:
       12.520        3.850
Results of confluence:
Total flow rate =     43.562(CFS)
Time of concentration =    15.206 min.
Effective stream area after confluence =     16.370(Ac.)


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Process from Point/Station      206.000 to Point/Station      207.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1465.000(Ft.)
Downstream point/station elevation =  1464.300(Ft.)
Pipe length  =   209.30(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    43.562(CFS)
Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =    43.562(CFS)
Normal flow depth in pipe =   29.25(In.)
Flow top width inside pipe =   33.77(In.)
Critical Depth =   25.23(In.)
Pipe flow velocity =      6.52(Ft/s)
Travel time through pipe =    0.53 min.
Time of concentration (TC) =    15.74 min.


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Process from Point/Station      207.000 to Point/Station      207.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.859
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    15.74 min.
Rainfall intensity =      2.933(In/Hr) for a   100.0 year storm
Subarea runoff =      5.667(CFS) for      2.250(Ac.)
Total runoff =     49.229(CFS)    Total area =      18.620(Ac.)


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Process from Point/Station      207.000 to Point/Station      207.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
CONDOMINIUM subarea type
Runoff Coefficient = 0.859
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    15.74 min.
Rainfall intensity =      2.933(In/Hr) for a   100.0 year storm
Subarea runoff =      2.796(CFS) for      1.110(Ac.)
Total runoff =     52.024(CFS)    Total area =      19.730(Ac.)


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Process from Point/Station      207.000 to Point/Station      208.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1464.300(Ft.)
Downstream point/station elevation =  1464.100(Ft.)
Pipe length  =    84.20(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    52.024(CFS)
Nearest computed pipe diameter  =     42.00(In.)
Calculated individual pipe flow  =    52.024(CFS)
Normal flow depth in pipe =   37.41(In.)
Flow top width inside pipe =   26.22(In.)
Critical Depth =   27.07(In.)
Pipe flow velocity =      5.75(Ft/s)
Travel time through pipe =    0.24 min.
Time of concentration (TC) =    15.98 min.


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Process from Point/Station      208.000 to Point/Station      208.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
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Along Main Stream number: 1 in normal stream number 1
Stream flow area =     19.730(Ac.)
Runoff from this stream =     52.024(CFS)
Time of concentration =   15.98 min.
Rainfall intensity =     2.914(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      400.000 to Point/Station      401.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Initial area flow distance =   859.000(Ft.)
Top (of initial area) elevation =  1477.100(Ft.)
Bottom (of initial area) elevation =  1470.700(Ft.)
Difference in elevation =     6.400(Ft.)
Slope =    0.00745  s(percent)=       0.75
TC = k(0.370)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.701 min.
Rainfall intensity =      3.021(In/Hr) for a   100.0 year storm
CONDOMINIUM subarea type
Runoff Coefficient = 0.860
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Initial subarea runoff =     12.698(CFS)
Total initial stream area =        4.890(Ac.)
Pervious area fraction = 0.350


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      401.000 to Point/Station      402.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1466.500(Ft.)
Downstream point/station elevation =  1465.400(Ft.)
Pipe length  =    20.50(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.698(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    12.698(CFS)
Normal flow depth in pipe =   10.62(In.)
Flow top width inside pipe =   13.64(In.)
Critical depth could not be calculated.
Pipe flow velocity =     13.69(Ft/s)
Travel time through pipe =    0.02 min.
Time of concentration (TC) =    14.73 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      402.000 to Point/Station      402.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------
CONDOMINIUM subarea type
Runoff Coefficient = 0.860
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Time of concentration =    14.73 min.
Rainfall intensity =      3.019(In/Hr) for a   100.0 year storm
Subarea runoff =      5.293(CFS) for      2.040(Ac.)
Total runoff =     17.991(CFS)    Total area =       6.930(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      402.000 to Point/Station      208.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1465.400(Ft.)
Downstream point/station elevation =  1464.100(Ft.)
Pipe length  =   262.10(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    17.991(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    17.991(CFS)
Normal flow depth in pipe =   18.68(In.)
Flow top width inside pipe =   24.93(In.)
Critical Depth =   17.78(In.)
Pipe flow velocity =      6.13(Ft/s)
Travel time through pipe =    0.71 min.
Time of concentration (TC) =    15.44 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      208.000 to Point/Station      208.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      6.930(Ac.)
Runoff from this stream =     17.991(CFS)
Time of concentration =   15.44 min.
Rainfall intensity =     2.958(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       52.024     15.98                 2.914
2       17.991     15.44                 2.958
Largest stream flow has longer time of concentration
Qp =     52.024 + sum of
           Qb         Ia/Ib
           17.991 *    0.985 =     17.725
Qp =     69.749

Total of 2 streams to confluence:
Flow rates before confluence point:
      52.024      17.991
Area of streams before confluence:
       19.730        6.930
Results of confluence:
Total flow rate =     69.749(CFS)
Time of concentration =    15.985 min.
Effective stream area after confluence =     26.660(Ac.)
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      208.000 to Point/Station      209.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1464.100(Ft.)
Downstream point/station elevation =  1463.600(Ft.)
Pipe length  =   156.50(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    69.749(CFS)
Nearest computed pipe diameter  =     45.00(In.)
Calculated individual pipe flow  =    69.749(CFS)
Normal flow depth in pipe =   37.78(In.)
Flow top width inside pipe =   33.03(In.)
Critical Depth =   30.83(In.)
Pipe flow velocity =      7.05(Ft/s)
Travel time through pipe =    0.37 min.
Time of concentration (TC) =    16.35 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      209.000 to Point/Station      210.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.807
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  80.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    16.35 min.
Rainfall intensity =      2.886(In/Hr) for a   100.0 year storm
Subarea runoff =      5.145(CFS) for      2.210(Ac.)
Total runoff =     74.894(CFS)    Total area =      28.870(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      210.000 to Point/Station      210.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.888
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    16.35 min.
Rainfall intensity =      2.886(In/Hr) for a   100.0 year storm
Subarea runoff =      5.381(CFS) for      2.100(Ac.)
Total runoff =     80.275(CFS)    Total area =      30.970(Ac.)
End of computations, total study area =           30.97 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.379
Area averaged RI index number =  75.4
```
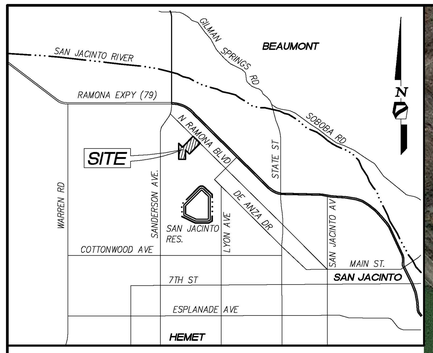

AREA C

```
                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 05/05/23  File:vcpro100.out
------------------------------------------------------------------------
Tr 38066 Valle Reseda
Rational Method
Proposed Condition (Area C)
5/5/23
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =  100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation =  0.486(In.)
100 year, 1 hour precipitation =  1.650(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.650(In/Hr)
Slope of intensity duration curve = 0.4300




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      500.000 to Point/Station      501.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   491.100(Ft.)
Top (of initial area) elevation =  1479.100(Ft.)
Bottom (of initial area) elevation =  1475.100(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00814  s(percent)=       0.81
TC = k(0.370)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.548 min.
Rainfall intensity =      3.351(In/Hr) for a   100.0 year storm
CONDOMINIUM subarea type
Runoff Coefficient = 0.863
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Initial subarea runoff =      3.413(CFS)
Total initial stream area =        1.180(Ac.)
Pervious area fraction = 0.350
End of computations, total study area =            1.18 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.350
Area averaged RI index number =  75.0
```

HYDROLOGY MAP



VICINITY MAP

N.T.S.

EXISTING STORM DRAIN

LOT "A"
WATER QUALITY
BASIN
TB=72.2
BOT=67.2
BOT AREA=5,850 SF
SUBDRAIN=63.2

BASIN A

A 1.08 | A 0.93 | A 0.94 | A 1.02 | A 0.15 | A 3.76 | C 1.18

104 → 103 → 102 → 101 → 300 → 501 → 500 → 200 → 100 → 202 → 201

L=75.5' | L=131.2' | L=118.4' | L=565.2' | L=91.1' | L=112.2' | L=510.9'

EL=1475.4 | EL=1479.1 | EL=1476.9

Q_{10}=12.4cfs, Q_{100}=21.9cfs, t=13.1, INV=1467.20, Area=7.88 acres

Q_{10}=11.1cfs, Q_{100}=19.5cfs, t=12.9, INV=1467.5, Area=6.85 acres

Q_{10}=7.9cfs, Q_{100}=13.9cfs, t=12.5, EL=1468.3, Area=4.93 acres

Q_{10}=6.1cfs, Q_{100}=10.6cfs, t=12.1, EL=1472.1, Area=3.76 acres, 1468.8 INV

Q_{10}=1.9cfs, Q_{100}=3.4cfs, t=11.8, EL=1475.1, Area=1.28 acres

Q_{10}=2.1cfs, Q_{100}=3.6cfs, t=9.2, EL=1476.0, Area=1.14 acres

B 1.77 | B 2.08 | B 1.68 | B 3.72 | B 1.14 | B 1.58 | B 0.80 | B 1.83 | B 2.25 | B 2.10 | B 2.21 | B 1.11 | B 2.04 | B 4.89 | B 1.77

302 → 301 → 206 → 205 → 204 → 203 → 207 → 208 → 209 → 401 → 402 → 400

L=560.8' | L=111.1' | L=209.3' | L=118.4' | L=193.2' | L=581.3' | L=659.1' | L=366.1' | L=84.2' | L=156.5' | L=262.1' | L=659.0'

EL=1477.1

Q_{10}=6.0cfs, Q_{100}=10.5cfs, t=13.4, Inv=1463.6, Area=3.85 acres

Q_{10}=24.3cfs, Q_{100}=43.6cfs, t=15.2, Inv=1465.0, Area=16.37 acres

Q_{10}=2.1cfs, Q_{100}=5.7cfs, t=13.2, EL=1470.03, Area=2.08 acres, 1465.7 INV

Q_{10}=10.1cfs, Q_{100}=18.1cfs, t=13.9, Inv=1466.2, Area=6.54 acres

Q_{10}=7.6cfs, Q_{100}=13.6cfs, t=13.8, EL=1471.3, Area=4.86 acres, 1466.27 INV

Q_{10}=2.1cfs, Q_{100}=3.6cfs, t=9.7, EL=1474.3, Area=1.14 acres

Q_{10}=18.7cfs, Q_{100}=33.6cfs, t=14.8, Inv=1465.3, Area=12.52 acres

Q_{10}=12.8cfs, Q_{100}=22.8cfs, t=14.5, Inv=1465.6, Area=8.37 acres

Q_{10}=28.9cfs, Q_{100}=52.0cfs, t=15.7, Inv=1464.3, Area=19.73 acres

Q_{10}=38.8cfs, Q_{100}=69.7cfs, t=16.0, Inv=1464.1, Area=26.66 acres

Q_{10}=10.2cfs, Q_{100}=18.0cfs, t=14.7, Inv=1465.4, Area=6.93 acres

Q_{10}=7.2cfs, Q_{100}=12.7cfs, t=14.7, EL=1470.7, Area=4.89 acres, 1466.5 INV

Q_{10}=44.5cfs, Q_{100}=80.3cfs, t=18.4, EL=1463.9, Area=30.97 acres

Q_{10}=38.8cfs, Q_{100}=69.7cfs, t=15.4, INV=1463.6, Area=26.66 acres

LOT "B"
WQ/DETENTION
BASIN
TB=70.0
SPILLWAY=69.5
WQ BOT=62.0
WQ SUBDRAIN=58.0
WQ AREA=10,292 SF

BASIN B

PROPOSED SPILLWAY

TM 38203
CONCURRENT
DEVELOPMENT

RAMONA BLVD

RANCH VIEW LN

LEGEND

- D / 3.0 — DRAINAGE AREA / ACREAGE
- MAJOR DRAINAGE AREA BOUNDARY
- SUBAREA DRAINAGE BOUNDARY
- PROPOSED STORM DRAIN
- FLOW LINE (SURFACE FLOW)
- FLOW LINE (PIPE FLOW)
- 1 — NODE & NODE #
- EXISTING STORM DRAIN
- FUTURE STORM DRAIN

DATE PREPARED: 07-21-2022

PREPARED BY:

HUNSAKER & ASSOCIATES
IRVINE, INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
Three Hughes ▪ Irvine, CA 92618 ▪ PH: (949) 583-1010 ▪ FX: (949) 583-0759

0 40 80 160 240 320
SCALE: 1" = 80'

HYDROLOGY MAP
PROPOSED CONDITION
VALLE RESEDA
TR 38066
RIVERSIDE CO, CA

PLOTTED BY: Brian Sauther DATE: May. 10, 2023 01:57:02 PM FILE: F:\1244\Engineering\SY_Hydrology\Hydrology Map-Pro-2023-0504.dwg

SECTION 4
EXISTING CONDITION HYDROLOGY
UNIT HYDROGRAPH METHOD ANALYSIS
AREA B

2-YEAR, 24HR STORM

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
Study date 05/09/23 File: vbuhex242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Existing Condition (Area B)
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1624.00(Ft.)
Length along longest watercourse measured to centroid = 1128.00(Ft.)
Length along longest watercourse = 0.308 Mi.
Length along longest watercourse measured to centroid = 0.214 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 22.7586 Ft./Mi.
Average Manning's 'N' = 0.035
Lag time = 0.165 Hr.
Lag time = 9.89 Min.
25% of lag time = 2.47 Min.
40% of lag time = 3.96 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	2.04	63.18

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	5.36	166.00

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.040(In)
Area Averaged 100-Year Rainfall = 5.360(In)

Point rain (area averaged) = 2.040(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 2.040(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
29.140	92.00	0.000
1.830	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
92.0	81.6	0.226	0.000	0.226	0.941	0.212
92.0	81.6	0.226	0.650	0.094	0.059	0.006
					Sum (F) =	0.218

Area averaged mean soil loss (F) (In/Hr) = 0.218
Minimum soil loss rate ((In/Hr)) = 0.109
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	50.547	6.228	1.944
2	0.167	101.095	26.617	8.308
3	0.250	151.642	28.792	8.987
4	0.333	202.190	12.761	3.983
5	0.417	252.737	6.744	2.105
6	0.500	303.284	4.695	1.465
7	0.583	353.832	3.374	1.053
8	0.667	404.379	2.567	0.801
9	0.750	454.927	1.870	0.584
10	0.833	505.474	1.555	0.485
11	0.917	556.021	1.271	0.397
12	1.000	606.569	0.987	0.308
13	1.083	657.116	0.782	0.244
14	1.167	707.664	0.580	0.181
15	1.250	758.211	0.505	0.158
16	1.333	808.758	0.671	0.209
			Sum = 100.000 Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time	(Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.016	(0.386)	0.015	0.002

2	0.17	0.07	0.016	(0.385)	0.015	0.002
3	0.25	0.07	0.016	(0.383)	0.015	0.002
4	0.33	0.10	0.024	(0.382)	0.022	0.002
5	0.42	0.10	0.024	(0.380)	0.022	0.002
6	0.50	0.10	0.024	(0.379)	0.022	0.002
7	0.58	0.10	0.024	(0.377)	0.022	0.002
8	0.67	0.10	0.024	(0.376)	0.022	0.002
9	0.75	0.10	0.024	(0.375)	0.022	0.002
10	0.83	0.13	0.033	(0.373)	0.029	0.003
11	0.92	0.13	0.033	(0.372)	0.029	0.003
12	1.00	0.13	0.033	(0.370)	0.029	0.003
13	1.08	0.10	0.024	(0.369)	0.022	0.002
14	1.17	0.10	0.024	(0.367)	0.022	0.002
15	1.25	0.10	0.024	(0.366)	0.022	0.002
16	1.33	0.10	0.024	(0.364)	0.022	0.002
17	1.42	0.10	0.024	(0.363)	0.022	0.002
18	1.50	0.10	0.024	(0.361)	0.022	0.002
19	1.58	0.10	0.024	(0.360)	0.022	0.002
20	1.67	0.10	0.024	(0.358)	0.022	0.002
21	1.75	0.10	0.024	(0.357)	0.022	0.002
22	1.83	0.13	0.033	(0.356)	0.029	0.003
23	1.92	0.13	0.033	(0.354)	0.029	0.003
24	2.00	0.13	0.033	(0.353)	0.029	0.003
25	2.08	0.13	0.033	(0.351)	0.029	0.003
26	2.17	0.13	0.033	(0.350)	0.029	0.003
27	2.25	0.13	0.033	(0.348)	0.029	0.003
28	2.33	0.13	0.033	(0.347)	0.029	0.003
29	2.42	0.13	0.033	(0.346)	0.029	0.003
30	2.50	0.13	0.033	(0.344)	0.029	0.003
31	2.58	0.17	0.041	(0.343)	0.037	0.004
32	2.67	0.17	0.041	(0.341)	0.037	0.004
33	2.75	0.17	0.041	(0.340)	0.037	0.004
34	2.83	0.17	0.041	(0.339)	0.037	0.004
35	2.92	0.17	0.041	(0.337)	0.037	0.004
36	3.00	0.17	0.041	(0.336)	0.037	0.004
37	3.08	0.17	0.041	(0.334)	0.037	0.004
38	3.17	0.17	0.041	(0.333)	0.037	0.004
39	3.25	0.17	0.041	(0.332)	0.037	0.004
40	3.33	0.17	0.041	(0.330)	0.037	0.004
41	3.42	0.17	0.041	(0.329)	0.037	0.004
42	3.50	0.17	0.041	(0.328)	0.037	0.004
43	3.58	0.17	0.041	(0.326)	0.037	0.004
44	3.67	0.17	0.041	(0.325)	0.037	0.004
45	3.75	0.17	0.041	(0.323)	0.037	0.004
46	3.83	0.20	0.049	(0.322)	0.044	0.005
47	3.92	0.20	0.049	(0.321)	0.044	0.005
48	4.00	0.20	0.049	(0.319)	0.044	0.005
49	4.08	0.20	0.049	(0.318)	0.044	0.005
50	4.17	0.20	0.049	(0.317)	0.044	0.005
51	4.25	0.20	0.049	(0.315)	0.044	0.005
52	4.33	0.23	0.057	(0.314)	0.051	0.006
53	4.42	0.23	0.057	(0.313)	0.051	0.006
54	4.50	0.23	0.057	(0.311)	0.051	0.006
55	4.58	0.23	0.057	(0.310)	0.051	0.006
56	4.67	0.23	0.057	(0.309)	0.051	0.006
57	4.75	0.23	0.057	(0.307)	0.051	0.006
58	4.83	0.27	0.065	(0.306)	0.059	0.007
59	4.92	0.27	0.065	(0.305)	0.059	0.007
60	5.00	0.27	0.065	(0.303)	0.059	0.007
61	5.08	0.20	0.049	(0.302)	0.044	0.005
62	5.17	0.20	0.049	(0.301)	0.044	0.005
63	5.25	0.20	0.049	(0.299)	0.044	0.005
64	5.33	0.23	0.057	(0.298)	0.051	0.006
65	5.42	0.23	0.057	(0.297)	0.051	0.006
66	5.50	0.23	0.057	(0.295)	0.051	0.006
67	5.58	0.27	0.065	(0.294)	0.059	0.007
68	5.67	0.27	0.065	(0.293)	0.059	0.007
69	5.75	0.27	0.065	(0.292)	0.059	0.007
70	5.83	0.27	0.065	(0.290)	0.059	0.007
71	5.92	0.27	0.065	(0.289)	0.059	0.007
72	6.00	0.27	0.065	(0.288)	0.059	0.007
73	6.08	0.30	0.073	(0.286)	0.066	0.007
74	6.17	0.30	0.073	(0.285)	0.066	0.007
75	6.25	0.30	0.073	(0.284)	0.066	0.007
76	6.33	0.30	0.073	(0.283)	0.066	0.007
77	6.42	0.30	0.073	(0.281)	0.066	0.007
78	6.50	0.30	0.073	(0.280)	0.066	0.007
79	6.58	0.33	0.082	(0.279)	0.073	0.008
80	6.67	0.33	0.082	(0.278)	0.073	0.008
81	6.75	0.33	0.082	(0.276)	0.073	0.008
82	6.83	0.33	0.082	(0.275)	0.073	0.008
83	6.92	0.33	0.082	(0.274)	0.073	0.008
84	7.00	0.33	0.082	(0.273)	0.073	0.008
85	7.08	0.33	0.082	(0.271)	0.073	0.008
86	7.17	0.33	0.082	(0.270)	0.073	0.008
87	7.25	0.33	0.082	(0.269)	0.073	0.008
88	7.33	0.37	0.090	(0.268)	0.081	0.009
89	7.42	0.37	0.090	(0.266)	0.081	0.009
90	7.50	0.37	0.090	(0.265)	0.081	0.009
91	7.58	0.40	0.098	(0.264)	0.088	0.010
92	7.67	0.40	0.098	(0.263)	0.088	0.010
93	7.75	0.40	0.098	(0.262)	0.088	0.010
94	7.83	0.43	0.106	(0.260)	0.095	0.011
95	7.92	0.43	0.106	(0.259)	0.095	0.011
96	8.00	0.43	0.106	(0.258)	0.095	0.011
97	8.08	0.50	0.122	(0.257)	0.110	0.012
98	8.17	0.50	0.122	(0.256)	0.110	0.012
99	8.25	0.50	0.122	(0.254)	0.110	0.012
100	8.33	0.50	0.122	(0.253)	0.110	0.012
101	8.42	0.50	0.122	(0.252)	0.110	0.012
102	8.50	0.50	0.122	(0.251)	0.110	0.012
103	8.58	0.53	0.131	(0.250)	0.117	0.013
104	8.67	0.53	0.131	(0.248)	0.117	0.013
105	8.75	0.53	0.131	(0.247)	0.117	0.013
106	8.83	0.57	0.139	(0.246)	0.125	0.014
107	8.92	0.57	0.139	(0.245)	0.125	0.014
108	9.00	0.57	0.139	(0.244)	0.125	0.014
109	9.08	0.63	0.155	(0.243)	0.140	0.016
110	9.17	0.63	0.155	(0.241)	0.140	0.016
111	9.25	0.63	0.155	(0.240)	0.140	0.016
112	9.33	0.67	0.163	(0.239)	0.147	0.016
113	9.42	0.67	0.163	(0.238)	0.147	0.016
114	9.50	0.67	0.163	(0.237)	0.147	0.016
115	9.58	0.70	0.171	(0.236)	0.154	0.017
116	9.67	0.70	0.171	(0.235)	0.154	0.017
117	9.75	0.70	0.171	(0.234)	0.154	0.017
118	9.83	0.73	0.180	(0.232)	0.162	0.018
119	9.92	0.73	0.180	(0.231)	0.162	0.018
120	10.00	0.73	0.180	(0.230)	0.162	0.018
121	10.08	0.50	0.122	(0.229)	0.110	0.012

122	10.17	0.50	0.122	(	0.228)	0.110	0.012	182	15.17	0.80	0.196		0.168	(	0.176)	0.027
123	10.25	0.50	0.122	(	0.227)	0.110	0.012	183	15.25	0.80	0.196		0.168	(	0.176)	0.028
124	10.33	0.50	0.122	(	0.226)	0.110	0.012	184	15.33	0.77	0.188		0.167	(	0.169)	0.021
125	10.42	0.50	0.122	(	0.225)	0.110	0.012	185	15.42	0.77	0.188		0.166	(	0.169)	0.022
126	10.50	0.50	0.122	(	0.224)	0.110	0.012	186	15.50	0.77	0.188		0.165	(	0.169)	0.023
127	10.58	0.67	0.163	(	0.222)	0.147	0.016	187	15.58	0.63	0.155	(	0.164)		0.140	0.016
128	10.67	0.67	0.163	(	0.221)	0.147	0.016	188	15.67	0.63	0.155	(	0.163)		0.140	0.016
129	10.75	0.67	0.163	(	0.220)	0.147	0.016	189	15.75	0.63	0.155	(	0.163)		0.140	0.016
130	10.83	0.67	0.163	(	0.219)	0.147	0.016	190	15.83	0.63	0.155	(	0.162)		0.140	0.016
131	10.92	0.67	0.163	(	0.218)	0.147	0.016	191	15.92	0.63	0.155	(	0.161)		0.140	0.016
132	11.00	0.67	0.163	(	0.217)	0.147	0.016	192	16.00	0.63	0.155	(	0.160)		0.140	0.016
133	11.08	0.63	0.155	(	0.216)	0.140	0.016	193	16.08	0.13	0.033	(	0.159)		0.029	0.003
134	11.17	0.63	0.155	(	0.215)	0.140	0.016	194	16.17	0.13	0.033	(	0.158)		0.029	0.003
135	11.25	0.63	0.155	(	0.214)	0.140	0.016	195	16.25	0.13	0.033	(	0.158)		0.029	0.003
136	11.33	0.63	0.155	(	0.213)	0.140	0.016	196	16.33	0.13	0.033	(	0.157)		0.029	0.003
137	11.42	0.63	0.155	(	0.212)	0.140	0.016	197	16.42	0.13	0.033	(	0.156)		0.029	0.003
138	11.50	0.63	0.155	(	0.211)	0.140	0.016	198	16.50	0.13	0.033	(	0.155)		0.029	0.003
139	11.58	0.57	0.139	(	0.210)	0.125	0.014	199	16.58	0.10	0.024	(	0.154)		0.022	0.002
140	11.67	0.57	0.139	(	0.209)	0.125	0.014	200	16.67	0.10	0.024	(	0.154)		0.022	0.002
141	11.75	0.57	0.139	(	0.208)	0.125	0.014	201	16.75	0.10	0.024	(	0.153)		0.022	0.002
142	11.83	0.60	0.147	(	0.207)	0.132	0.015	202	16.83	0.10	0.024	(	0.152)		0.022	0.002
143	11.92	0.60	0.147	(	0.206)	0.132	0.015	203	16.92	0.10	0.024	(	0.151)		0.022	0.002
144	12.00	0.60	0.147	(	0.204)	0.132	0.015	204	17.00	0.10	0.024	(	0.151)		0.022	0.002
145	12.08	0.83	0.204	(	0.203)	0.184	0.020	205	17.08	0.17	0.041	(	0.150)		0.037	0.004
146	12.17	0.83	0.204	(	0.202)	0.184	0.020	206	17.17	0.17	0.041	(	0.149)		0.037	0.004
147	12.25	0.83	0.204	(	0.201)	0.184	0.020	207	17.25	0.17	0.041	(	0.148)		0.037	0.004
148	12.33	0.87	0.212	(	0.200)	0.191	0.021	208	17.33	0.17	0.041	(	0.148)		0.037	0.004
149	12.42	0.87	0.212	(	0.199)	0.191	0.021	209	17.42	0.17	0.041	(	0.147)		0.037	0.004
150	12.50	0.87	0.212	(	0.198)	0.191	0.021	210	17.50	0.17	0.041	(	0.146)		0.037	0.004
151	12.58	0.93	0.228		0.197	(0.206)	0.031	211	17.58	0.17	0.041	(	0.145)		0.037	0.004
152	12.67	0.93	0.228		0.196	(0.206)	0.032	212	17.67	0.17	0.041	(	0.145)		0.037	0.004
153	12.75	0.93	0.228		0.195	(0.206)	0.033	213	17.75	0.17	0.041	(	0.144)		0.037	0.004
154	12.83	0.97	0.237		0.194	(0.213)	0.042	214	17.83	0.13	0.033	(	0.143)		0.029	0.003
155	12.92	0.97	0.237		0.193	(0.213)	0.043	215	17.92	0.13	0.033	(	0.142)		0.029	0.003
156	13.00	0.97	0.237		0.192	(0.213)	0.044	216	18.00	0.13	0.033	(	0.142)		0.029	0.003
157	13.08	1.13	0.277		0.191	(0.250)	0.086	217	18.08	0.13	0.033	(	0.141)		0.029	0.003
158	13.17	1.13	0.277		0.191	(0.250)	0.087	218	18.17	0.13	0.033	(	0.140)		0.029	0.003
159	13.25	1.13	0.277		0.190	(0.250)	0.088	219	18.25	0.13	0.033	(	0.140)		0.029	0.003
160	13.33	1.13	0.277		0.189	(0.250)	0.089	220	18.33	0.13	0.033	(	0.139)		0.029	0.003
161	13.42	1.13	0.277		0.188	(0.250)	0.090	221	18.42	0.13	0.033	(	0.138)		0.029	0.003
162	13.50	1.13	0.277		0.187	(0.250)	0.091	222	18.50	0.13	0.033	(	0.138)		0.029	0.003
163	13.58	0.77	0.188	(	0.186)	0.169	0.019	223	18.58	0.10	0.024	(	0.137)		0.022	0.002
164	13.67	0.77	0.188	(	0.185)	0.169	0.019	224	18.67	0.10	0.024	(	0.136)		0.022	0.002
165	13.75	0.77	0.188	(	0.184)	0.169	0.019	225	18.75	0.10	0.024	(	0.136)		0.022	0.002
166	13.83	0.77	0.188	(	0.183)	0.169	0.019	226	18.83	0.07	0.016	(	0.135)		0.015	0.002
167	13.92	0.77	0.188	(	0.182)	0.169	0.019	227	18.92	0.07	0.016	(	0.134)		0.015	0.002
168	14.00	0.77	0.188	(	0.181)	0.169	0.019	228	19.00	0.07	0.016	(	0.134)		0.015	0.002
169	14.08	0.90	0.220		0.180	(0.198)	0.040	229	19.08	0.10	0.024	(	0.133)		0.022	0.002
170	14.17	0.90	0.220		0.179	(0.198)	0.041	230	19.17	0.10	0.024	(	0.132)		0.022	0.002
171	14.25	0.90	0.220		0.178	(0.198)	0.042	231	19.25	0.10	0.024	(	0.132)		0.022	0.002
172	14.33	0.87	0.212		0.177	(0.191)	0.035	232	19.33	0.13	0.033	(	0.131)		0.029	0.003
173	14.42	0.87	0.212		0.176	(0.191)	0.036	233	19.42	0.13	0.033	(	0.131)		0.029	0.003
174	14.50	0.87	0.212		0.176	(0.191)	0.037	234	19.50	0.13	0.033	(	0.130)		0.029	0.003
175	14.58	0.87	0.212		0.175	(0.191)	0.037	235	19.58	0.10	0.024	(	0.129)		0.022	0.002
176	14.67	0.87	0.212		0.174	(0.191)	0.038	236	19.67	0.10	0.024	(	0.129)		0.022	0.002
177	14.75	0.87	0.212		0.173	(0.191)	0.039	237	19.75	0.10	0.024	(	0.128)		0.022	0.002
178	14.83	0.83	0.204		0.172	(0.184)	0.032	238	19.83	0.07	0.016	(	0.128)		0.015	0.002
179	14.92	0.83	0.204		0.171	(0.184)	0.033	239	19.92	0.07	0.016	(	0.127)		0.015	0.002
180	15.00	0.83	0.204		0.170	(0.184)	0.034	240	20.00	0.07	0.016	(	0.127)		0.015	0.002
181	15.08	0.80	0.196		0.169	(0.176)	0.026	241	20.08	0.10	0.024	(	0.126)		0.022	0.002

242	20.17	0.10	0.024	(0.125)	0.022	0.002
243	20.25	0.10	0.024	(0.125)	0.022	0.002
244	20.33	0.10	0.024	(0.124)	0.022	0.002
245	20.42	0.10	0.024	(0.124)	0.022	0.002
246	20.50	0.10	0.024	(0.123)	0.022	0.002
247	20.58	0.10	0.024	(0.123)	0.022	0.002
248	20.67	0.10	0.024	(0.122)	0.022	0.002
249	20.75	0.10	0.024	(0.122)	0.022	0.002
250	20.83	0.07	0.016	(0.121)	0.015	0.002
251	20.92	0.07	0.016	(0.121)	0.015	0.002
252	21.00	0.07	0.016	(0.120)	0.015	0.002
253	21.08	0.10	0.024	(0.120)	0.022	0.002
254	21.17	0.10	0.024	(0.119)	0.022	0.002
255	21.25	0.10	0.024	(0.119)	0.022	0.002
256	21.33	0.07	0.016	(0.118)	0.015	0.002
257	21.42	0.07	0.016	(0.118)	0.015	0.002
258	21.50	0.07	0.016	(0.118)	0.015	0.002
259	21.58	0.10	0.024	(0.117)	0.022	0.002
260	21.67	0.10	0.024	(0.117)	0.022	0.002
261	21.75	0.10	0.024	(0.116)	0.022	0.002
262	21.83	0.07	0.016	(0.116)	0.015	0.002
263	21.92	0.07	0.016	(0.115)	0.015	0.002
264	22.00	0.07	0.016	(0.115)	0.015	0.002
265	22.08	0.10	0.024	(0.115)	0.022	0.002
266	22.17	0.10	0.024	(0.114)	0.022	0.002
267	22.25	0.10	0.024	(0.114)	0.022	0.002
268	22.33	0.07	0.016	(0.114)	0.015	0.002
269	22.42	0.07	0.016	(0.113)	0.015	0.002
270	22.50	0.07	0.016	(0.113)	0.015	0.002
271	22.58	0.07	0.016	(0.113)	0.015	0.002
272	22.67	0.07	0.016	(0.112)	0.015	0.002
273	22.75	0.07	0.016	(0.112)	0.015	0.002
274	22.83	0.07	0.016	(0.112)	0.015	0.002
275	22.92	0.07	0.016	(0.111)	0.015	0.002
276	23.00	0.07	0.016	(0.111)	0.015	0.002
277	23.08	0.07	0.016	(0.111)	0.015	0.002
278	23.17	0.07	0.016	(0.111)	0.015	0.002
279	23.25	0.07	0.016	(0.110)	0.015	0.002
280	23.33	0.07	0.016	(0.110)	0.015	0.002
281	23.42	0.07	0.016	(0.110)	0.015	0.002
282	23.50	0.07	0.016	(0.110)	0.015	0.002
283	23.58	0.07	0.016	(0.110)	0.015	0.002
284	23.67	0.07	0.016	(0.109)	0.015	0.002
285	23.75	0.07	0.016	(0.109)	0.015	0.002
286	23.83	0.07	0.016	(0.109)	0.015	0.002
287	23.92	0.07	0.016	(0.109)	0.015	0.002
288	24.00	0.07	0.016	(0.109)	0.015	0.002

(Loss Rate Not Used)

Sum = 100.0 Sum = 3.1

Flood volume = Effective rainfall 0.26(In)
times area 31.0(Ac.)/[(In)/(Ft.)] = 0.7(Ac.Ft)
Total soil loss = 1.78(In)
Total soil loss = 4.594(Ac.Ft)
Total rainfall = 2.04(In)
Flood volume = 29223.6 Cubic Feet
Total soil loss = 200101.6 Cubic Feet

Peak flow rate of this hydrograph = 2.541(CFS)

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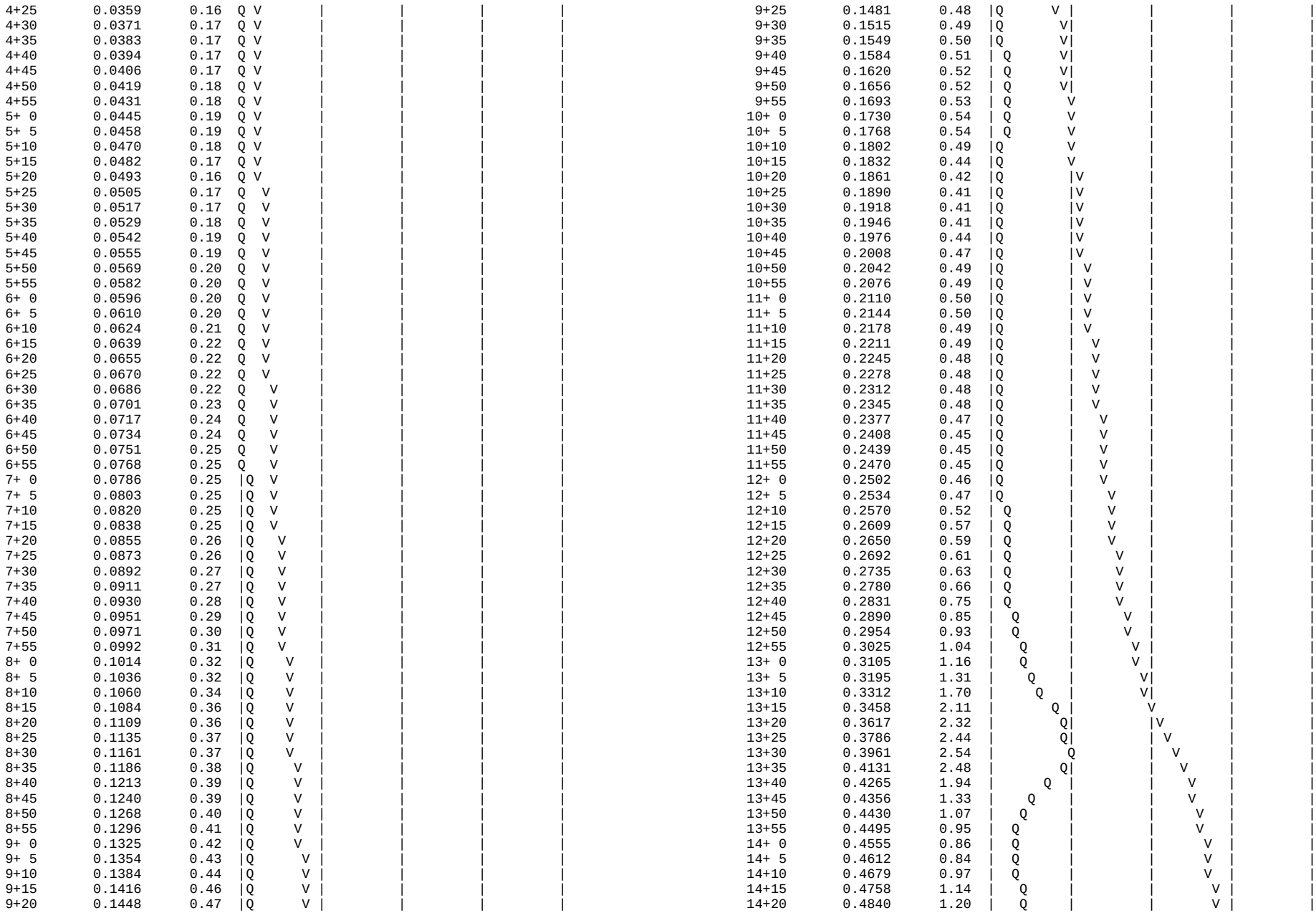
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0001	0.02	Q				
0+15	0.0004	0.03	Q				
0+20	0.0006	0.04	Q				
0+25	0.0010	0.05	Q				
0+30	0.0014	0.06	Q				
0+35	0.0018	0.06	Q				
0+40	0.0023	0.07	Q				
0+45	0.0028	0.07	Q				
0+50	0.0033	0.07	Q				
0+55	0.0038	0.08	Q				
1+ 0	0.0044	0.09	Q				
1+ 5	0.0051	0.09	Q				
1+10	0.0057	0.09	Q				
1+15	0.0062	0.08	Q				
1+20	0.0068	0.08	Q				
1+25	0.0073	0.08	Q				
1+30	0.0079	0.08	Q				
1+35	0.0084	0.08	Q				
1+40	0.0089	0.08	Q				
1+45	0.0095	0.08	Q				
1+50	0.0100	0.08	Q				
1+55	0.0106	0.09	Q				
2+ 0	0.0112	0.09	Q				
2+ 5	0.0119	0.10	Q				
2+10	0.0126	0.10	Q				
2+15	0.0132	0.10	Q				
2+20	0.0139	0.10	Q				
2+25	0.0146	0.10	Q				
2+30	0.0153	0.10	Q				
2+35	0.0160	0.10	Q				
2+40	0.0168	0.11	Q				
2+45	0.0176	0.12	QV				
2+50	0.0184	0.12	QV				
2+55	0.0192	0.12	QV				
3+ 0	0.0201	0.12	QV				
3+ 5	0.0210	0.12	QV				
3+10	0.0218	0.13	QV				
3+15	0.0227	0.13	QV				
3+20	0.0236	0.13	QV				
3+25	0.0244	0.13	QV				
3+30	0.0253	0.13	QV				
3+35	0.0262	0.13	QV				
3+40	0.0270	0.13	QV				
3+45	0.0279	0.13	QV				
3+50	0.0288	0.13	QV				
3+55	0.0297	0.14	QV				
4+ 0	0.0307	0.14	QV				
4+ 5	0.0317	0.15	QV				
4+10	0.0328	0.15	QV				
4+15	0.0338	0.15	Q V				
4+20	0.0348	0.15	Q V				



14+25	0.4921	1.17	| Q	|	|	V|	|		19+25	0.6457	0.08	Q	|	|	|	V |
14+30	0.4999	1.13	| Q	|	|	V|	|		19+30	0.6464	0.09	Q	|	|	|	V |
14+35	0.5077	1.13	| Q	|	|	V	|		19+35	0.6470	0.09	Q	|	|	|	V |
14+40	0.5156	1.14	| Q	|	|	V	|		19+40	0.6476	0.09	Q	|	|	|	V |
14+45	0.5235	1.16	| Q	|	|	|V	|		19+45	0.6482	0.08	Q	|	|	|	V |
14+50	0.5315	1.15	| Q	|	|	|V	|		19+50	0.6487	0.08	Q	|	|	|	V |
14+55	0.5392	1.12	| Q	|	|	| V	|		19+55	0.6492	0.07	Q	|	|	|	V |
15+ 0	0.5465	1.07	| Q	|	|	| V	|		20+ 0	0.6496	0.06	Q	|	|	|	V |
15+ 5	0.5538	1.05	| Q	|	|	| V	|		20+ 5	0.6500	0.06	Q	|	|	|	V |
15+10	0.5606	0.99	| Q	|	|	| V	|		20+10	0.6505	0.07	Q	|	|	|	V |
15+15	0.5671	0.94	| Q	|	|	| V	|		20+15	0.6510	0.07	Q	|	|	|	V |
15+20	0.5733	0.91	| Q	|	|	| V	|		20+20	0.6515	0.07	Q	|	|	|	V |
15+25	0.5791	0.84	| Q	|	|	| V	|		20+25	0.6520	0.07	Q	|	|	|	V |
15+30	0.5845	0.78	| Q	|	|	| V	|		20+30	0.6525	0.07	Q	|	|	|	V |
15+35	0.5896	0.74	| Q	|	|	| V	|		20+35	0.6530	0.08	Q	|	|	|	V |
15+40	0.5942	0.67	| Q	|	|	| V	|		20+40	0.6535	0.08	Q	|	|	|	V |
15+45	0.5984	0.60	| Q	|	|	| V	|		20+45	0.6541	0.08	Q	|	|	|	V |
15+50	0.6023	0.57	| Q	|	|	| V	|		20+50	0.6546	0.07	Q	|	|	|	V|
15+55	0.6060	0.54	| Q	|	|	| V	|		20+55	0.6550	0.07	Q	|	|	|	V|
16+ 0	0.6096	0.53	| Q	|	|	| V	|		21+ 0	0.6555	0.06	Q	|	|	|	V|
16+ 5	0.6130	0.49	|Q	|	|	| V	|		21+ 5	0.6559	0.06	Q	|	|	|	V|
16+10	0.6157	0.38	|Q	|	|	| V	|		21+10	0.6563	0.06	Q	|	|	|	V|
16+15	0.6175	0.27	|Q	|	|	| V	|		21+15	0.6568	0.07	Q	|	|	|	V|
16+20	0.6190	0.21	Q	|	|	| V	|		21+20	0.6573	0.07	Q	|	|	|	V|
16+25	0.6202	0.18	Q	|	|	| V	|		21+25	0.6577	0.07	Q	|	|	|	V|
16+30	0.6214	0.16	Q	|	|	| V	|		21+30	0.6581	0.06	Q	|	|	|	V|
16+35	0.6224	0.14	Q	|	|	| V	|		21+35	0.6585	0.06	Q	|	|	|	V|
16+40	0.6232	0.13	Q	|	|	| V	|		21+40	0.6590	0.06	Q	|	|	|	V|
16+45	0.6240	0.11	Q	|	|	| V	|		21+45	0.6594	0.07	Q	|	|	|	V|
16+50	0.6247	0.10	Q	|	|	| V	|		21+50	0.6599	0.07	Q	|	|	|	V|
16+55	0.6254	0.09	Q	|	|	| V	|		21+55	0.6604	0.06	Q	|	|	|	V|
17+ 0	0.6260	0.09	Q	|	|	| V	|		22+ 0	0.6608	0.06	Q	|	|	|	V|
17+ 5	0.6266	0.09	Q	|	|	| V	|		22+ 5	0.6612	0.06	Q	|	|	|	V|
17+10	0.6273	0.10	Q	|	|	| V	|		22+10	0.6616	0.06	Q	|	|	|	V|
17+15	0.6281	0.11	Q	|	|	| V	|		22+15	0.6621	0.07	Q	|	|	|	V|
17+20	0.6288	0.12	Q	|	|	| V	|		22+20	0.6626	0.07	Q	|	|	|	V|
17+25	0.6297	0.12	Q	|	|	| V	|		22+25	0.6630	0.06	Q	|	|	|	V|
17+30	0.6305	0.12	Q	|	|	| V	|		22+30	0.6634	0.06	Q	|	|	|	V|
17+35	0.6313	0.12	Q	|	|	| V	|		22+35	0.6638	0.06	Q	|	|	|	V|
17+40	0.6322	0.12	Q	|	|	| V	|		22+40	0.6642	0.05	Q	|	|	|	V|
17+45	0.6330	0.12	Q	|	|	| V	|		22+45	0.6645	0.05	Q	|	|	|	V|
17+50	0.6339	0.12	Q	|	|	| V	|		22+50	0.6649	0.05	Q	|	|	|	V|
17+55	0.6347	0.12	Q	|	|	| V	|		22+55	0.6652	0.05	Q	|	|	|	V|
18+ 0	0.6355	0.11	Q	|	|	| V	|		23+ 0	0.6656	0.05	Q	|	|	|	V|
18+ 5	0.6362	0.11	Q	|	|	| V	|		23+ 5	0.6660	0.05	Q	|	|	|	V|
18+10	0.6369	0.11	Q	|	|	| V	|		23+10	0.6663	0.05	Q	|	|	|	V|
18+15	0.6377	0.11	Q	|	|	| V	|		23+15	0.6667	0.05	Q	|	|	|	V|
18+20	0.6384	0.10	Q	|	|	| V	|		23+20	0.6670	0.05	Q	|	|	|	V|
18+25	0.6391	0.10	Q	|	|	| V	|		23+25	0.6674	0.05	Q	|	|	|	V|
18+30	0.6398	0.10	Q	|	|	| V	|		23+30	0.6677	0.05	Q	|	|	|	V|
18+35	0.6405	0.10	Q	|	|	| V	|		23+35	0.6681	0.05	Q	|	|	|	V|
18+40	0.6412	0.09	Q	|	|	| V	|		23+40	0.6684	0.05	Q	|	|	|	V|
18+45	0.6418	0.09	Q	|	|	| V	|		23+45	0.6688	0.05	Q	|	|	|	V|
18+50	0.6423	0.08	Q	|	|	| V	|		23+50	0.6691	0.05	Q	|	|	|	V|
18+55	0.6428	0.07	Q	|	|	| V	|		23+55	0.6695	0.05	Q	|	|	|	V|
19+ 0	0.6433	0.06	Q	|	|	| V	|		24+ 0	0.6698	0.05	Q	|	|	|	V|
19+ 5	0.6437	0.06	Q	|	|	| V	|		24+ 5	0.6702	0.05	Q	|	|	|	V|
19+10	0.6442	0.07	Q	|	|	| V	|		24+10	0.6704	0.03	Q	|	|	|	V|
19+15	0.6446	0.07	Q	|	|	| V	|		24+15	0.6705	0.02	Q	|	|	|	V|
19+20	0.6452	0.08	Q	|	|	| V	|		24+20	0.6706	0.01	Q	|	|	|	V|

```
  24+25       0.6707      0.01  Q         |         |         |        V|
  24+30       0.6707      0.01  Q         |         |         |        V|
  24+35       0.6708      0.01  Q         |         |         |        V|
  24+40       0.6708      0.00  Q         |         |         |        V|
  24+45       0.6708      0.00  Q         |         |         |        V|
  24+50       0.6708      0.00  Q         |         |         |        V|
  24+55       0.6709      0.00  Q         |         |         |        V|
  25+ 0       0.6709      0.00  Q         |         |         |        V|
  25+ 5       0.6709      0.00  Q         |         |         |        V|
  25+10       0.6709      0.00  Q         |         |         |        V|
  25+15       0.6709      0.00  Q         |         |         |         V
-------------------------------------------------------------------------
```

10-YEAR, (1-HR, 3-HR, 6-HR, & 24HR) STORMS

```
        U n i t   H y d r o g r a p h   A n a l y s i s

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                Study date  05/10/23 File: vbuhex110.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6406

--------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------------
Valle Reseda TR 38066
Unit Hydrograph Method
Existing Condition (Area B) 10-year, 1 hr Storm
5/9/23
--------------------------------------------------------------------------
Drainage Area =      30.97(Ac.)  =      0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      30.97(Ac.)  =
0.048 Sq. Mi.
Length along longest watercourse =    1624.00(Ft.)
Length along longest watercourse measured to centroid =    1128.00(Ft.)
Length along longest watercourse =      0.308 Mi.
Length along longest watercourse measured to centroid =      0.214 Mi.
Difference in elevation =       7.00(Ft.)
Slope along watercourse =     22.7586 Ft./Mi.
Average Manning's 'N' = 0.035
Lag time =    0.165 Hr.
Lag time =     9.89 Min.
25% of lag time =     2.47 Min.
40% of lag time =     3.96 Min.
Unit time =     5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       30.97              0.49                   15.05

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       30.97              1.65                   51.10

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    0.486(In)
Area Averaged 100-Year Rainfall =    1.650(In)

Point rain (area averaged) =    0.965(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    0.965(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    29.140           92.00          0.000
     1.830           92.00          0.650
 Total Area Entered =     30.97(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
92.0  92.0      0.104     0.000        0.104       0.941      0.098
92.0  92.0      0.104     0.650        0.043       0.059      0.003
                                                 Sum (F) =   0.100
Area averaged mean soil loss (F) (In/Hr) =  0.100
Minimum soil loss rate ((In/Hr)) =  0.050
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
--------------------------------------------------------------------------
Slope of intensity-duration curve for a 1 hour storm =0.5000
--------------------------------------------------------------------------

                U n i t  H y d r o g r a p h
                      VALLEY S-Curve
--------------------------------------------------------------------------
                Unit Hydrograph Data
--------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
--------------------------------------------------------------------------
    1   0.083         50.547          6.228              1.944
    2   0.167        101.095         26.617              8.308
    3   0.250        151.642         28.792              8.987
    4   0.333        202.190         12.761              3.983
    5   0.417        252.737          6.744              2.105
    6   0.500        303.284          4.695              1.465
    7   0.583        353.832          3.374              1.053
    8   0.667        404.379          2.567              0.801
    9   0.750        454.927          1.870              0.584
   10   0.833        505.474          1.555              0.485
   11   0.917        556.021          1.271              0.397
   12   1.000        606.569          0.987              0.308
   13   1.083        657.116          0.782              0.244
   14   1.167        707.664          0.580              0.181
   15   1.250        758.211          0.505              0.158
   16   1.333        808.758          0.671              0.209
                              Sum = 100.000   Sum=      31.212
--------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
```

```
    (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
 1   0.08     4.20      0.486          0.100    (  0.438)        0.386
 2   0.17     4.30      0.498          0.100    (  0.448)        0.397
 3   0.25     5.00      0.579          0.100    (  0.521)        0.478
 4   0.33     5.00      0.579          0.100    (  0.521)        0.478
 5   0.42     5.80      0.671          0.100    (  0.604)        0.571
 6   0.50     6.50      0.752          0.100    (  0.677)        0.652
 7   0.58     7.40      0.857          0.100    (  0.771)        0.756
 8   0.67     8.60      0.995          0.100    (  0.896)        0.895
 9   0.75    12.30      1.424          0.100    (  1.281)        1.323
10   0.83    29.10      3.368          0.100    (  3.032)        3.268
11   0.92     6.80      0.787          0.100    (  0.708)        0.687
12   1.00     5.00      0.579          0.100    (  0.521)        0.478
              (Loss Rate Not Used)
   Sum =     100.0                                  Sum =    10.4
      Flood volume = Effective rainfall      0.86(In)
       times area      31.0(Ac.)/[(In)/(Ft.)] =       2.2(Ac.Ft)
      Total soil loss =      0.10(In)
      Total soil loss =     0.259(Ac.Ft)
      Total rainfall =      0.96(In)
      Flood volume =       97154.7 Cubic Feet
      Total soil loss =       11287.6 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     48.123(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          1 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                 Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       12.5      25.0      37.5      50.0
-------------------------------------------------------------------------
  0+ 5       0.0052      0.75  Q         |         |         |         |
  0+10       0.0326      3.98  V  Q      |         |         |         |
  0+15       0.0856      7.70  |V    Q   |         |         |         |
  0+20       0.1546     10.02  | V     Q |         |         |         |
  0+25       0.2357     11.78  |   V    Q|         |         |         |
  0+30       0.3296     13.62  |    V    Q         |         |         |
  0+35       0.4393     15.93  |      V  | Q       |         |         |
  0+40       0.5674     18.60  |         V   Q     |         |         |
  0+45       0.7214     22.36  |         | V    Q  |         |         |
  0+50       0.9413     31.93  |         |     V   |    Q    |         |
  0+55       1.2727     48.12  |         |         | V       |       Q |
  1+ 0       1.5911     46.22  |         |         |       V |     Q   |
  1+ 5       1.7947     29.56  |         |         |  Q      | V       |
  1+10       1.9226     18.57  |         |   Q     |         |   V     |
  1+15       2.0027     11.64  |        Q|         |         |    V    |
  1+20       2.0591      8.19  |     Q   |         |         |     V   |
  1+25       2.1014      6.14  |   Q     |         |         |      V  |
  1+30       2.1333      4.63  |  Q      |         |         |       V |
  1+35       2.1586      3.67  | Q       |         |         |       V |
  1+40       2.1785      2.90  | Q       |         |         |        V|
  1+45       2.1940      2.25  |Q        |         |         |        V|
  1+50       2.2060      1.74  |Q        |         |         |        V|
  1+55       2.2150      1.30  |Q        |         |         |        V|
  2+ 0       2.2221      1.03  Q         |         |         |        V|
  2+ 5       2.2282      0.88  Q         |         |         |        V|
  2+10       2.2297      0.22  Q         |         |         |        V|
  2+15       2.2304      0.10  Q         |         |         |        V
-------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/10/23 File: vbuhex310.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Existing Condition (Area B) 10-year, 3 hr Storm
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1624.00(Ft.)
Length along longest watercourse measured to centroid = 1128.00(Ft.)
Length along longest watercourse = 0.308 Mi.
Length along longest watercourse measured to centroid = 0.214 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 22.7586 Ft./Mi.
Average Manning's 'N' = 0.035
Lag time = 0.165 Hr.
Lag time = 9.89 Min.
25% of lag time = 2.47 Min.
40% of lag time = 3.96 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	0.83	25.86

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	2.23	69.06

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.835(In)
Area Averaged 100-Year Rainfall = 2.230(In)

Point rain (area averaged) = 1.409(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.409(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
29.140	92.00	0.000
1.830	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
92.0	92.0	0.104	0.000	0.104	0.941	0.098
92.0	92.0	0.104	0.650	0.043	0.059	0.003
					Sum (F) =	0.100

Area averaged mean soil loss (F) (In/Hr) = 0.100
Minimum soil loss rate ((In/Hr)) = 0.050
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	50.547	6.228	1.944
2	0.167	101.095	26.617	8.308
3	0.250	151.642	28.792	8.987
4	0.333	202.190	12.761	3.983
5	0.417	252.737	6.744	2.105
6	0.500	303.284	4.695	1.465
7	0.583	353.832	3.374	1.053
8	0.667	404.379	2.567	0.801
9	0.750	454.927	1.870	0.584
10	0.833	505.474	1.555	0.485
11	0.917	556.021	1.271	0.397
12	1.000	606.569	0.987	0.308
13	1.083	657.116	0.782	0.244
14	1.167	707.664	0.580	0.181
15	1.250	758.211	0.505	0.158
16	1.333	808.758	0.671	0.209
		Sum = 100.000	Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time	Pattern	Storm Rain	Loss rate(In./Hr)		Effective
(Hr.)	Percent	(In/Hr)	Max	Low	(In/Hr)
1 0.08	1.30	0.220	0.100	(0.198)	0.119

2	0.17	1.30	0.220	0.100	(0.198)	0.119
3	0.25	1.10	0.186	0.100	(0.167)	0.086
4	0.33	1.50	0.254	0.100	(0.228)	0.153
5	0.42	1.50	0.254	0.100	(0.228)	0.153
6	0.50	1.80	0.304	0.100	(0.274)	0.204
7	0.58	1.50	0.254	0.100	(0.228)	0.153
8	0.67	1.80	0.304	0.100	(0.274)	0.204
9	0.75	1.80	0.304	0.100	(0.274)	0.204
10	0.83	1.50	0.254	0.100	(0.228)	0.153
11	0.92	1.60	0.270	0.100	(0.243)	0.170
12	1.00	1.80	0.304	0.100	(0.274)	0.204
13	1.08	2.20	0.372	0.100	(0.335)	0.271
14	1.17	2.20	0.372	0.100	(0.335)	0.271
15	1.25	2.20	0.372	0.100	(0.335)	0.271
16	1.33	2.00	0.338	0.100	(0.304)	0.238
17	1.42	2.60	0.440	0.100	(0.396)	0.339
18	1.50	2.70	0.456	0.100	(0.411)	0.356
19	1.58	2.40	0.406	0.100	(0.365)	0.305
20	1.67	2.70	0.456	0.100	(0.411)	0.356
21	1.75	3.30	0.558	0.100	(0.502)	0.457
22	1.83	3.10	0.524	0.100	(0.472)	0.424
23	1.92	2.90	0.490	0.100	(0.441)	0.390
24	2.00	3.00	0.507	0.100	(0.456)	0.407
25	2.08	3.10	0.524	0.100	(0.472)	0.424
26	2.17	4.20	0.710	0.100	(0.639)	0.610
27	2.25	5.00	0.845	0.100	(0.761)	0.745
28	2.33	3.50	0.592	0.100	(0.532)	0.491
29	2.42	6.80	1.150	0.100	(1.035)	1.049
30	2.50	7.30	1.234	0.100	(1.111)	1.134
31	2.58	8.20	1.386	0.100	(1.248)	1.286
32	2.67	5.90	0.997	0.100	(0.898)	0.897
33	2.75	2.00	0.338	0.100	(0.304)	0.238
34	2.83	1.80	0.304	0.100	(0.274)	0.204
35	2.92	1.80	0.304	0.100	(0.274)	0.204
36	3.00	0.60	0.101	(0.100)	0.091	0.010

(Loss Rate Not Used)

Sum = 100.0 Sum = 13.3

Flood volume = Effective rainfall 1.11(In)
times area 31.0(Ac.)/[(In)/(Ft.)] = 2.9(Ac.Ft)
Total soil loss = 0.30(In)
Total soil loss = 0.775(Ac.Ft)
Total rainfall = 1.41(In)
Flood volume = 124592.7 Cubic Feet
Total soil loss = 33777.5 Cubic Feet

Peak flow rate of this hydrograph = 30.919(CFS)

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3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0016	0.23	Q				
0+10	0.0100	1.22	VQ				
0+15	0.0254	2.23	V Q				
0+20	0.0430	2.56	V Q				
0+25	0.0641	3.07	V Q				
0+30	0.0904	3.81	V Q				
0+35	0.1211	4.46	V Q				
0+40	0.1541	4.78	V Q				
0+45	0.1891	5.08	V Q				
0+50	0.2266	5.45	V Q				
0+55	0.2632	5.31	V Q				
1+ 0	0.2990	5.21	VQ				
1+ 5	0.3381	5.68	VQ				
1+10	0.3835	6.59	VQ				
1+15	0.4342	7.36	VQ				
1+20	0.4869	7.66	VQ				
1+25	0.5405	7.78	Q				
1+30	0.5990	8.49	Q				
1+35	0.6638	9.42	Q				
1+40	0.7303	9.65	QV				
1+45	0.7999	10.11	QV				
1+50	0.8778	11.32	QV				
1+55	0.9614	12.13	QV				
2+ 0	1.0448	12.12	Q V				
2+ 5	1.1286	12.16	Q V				
2+10	1.2170	12.83	Q V				
2+15	1.3197	14.92	Q V				
2+20	1.4393	17.37	Q V				
2+25	1.5659	18.39	Q V				
2+30	1.7167	21.90	Q V				
2+35	1.9063	27.52	VQ				
2+40	2.1192	30.92	VQ				
2+45	2.3205	29.23	Q V				
2+50	2.4703	21.75	Q V				
2+55	2.5737	15.02	Q V				
3+ 0	2.6540	11.66	Q V				
3+ 5	2.7123	8.47	Q V				
3+10	2.7511	5.62	Q V				
3+15	2.7790	4.05	Q V				
3+20	2.8002	3.09	Q V				
3+25	2.8169	2.42	Q V				
3+30	2.8297	1.86	Q V				
3+35	2.8393	1.38	Q V				
3+40	2.8469	1.11	Q V				
3+45	2.8525	0.81	Q V				
3+50	2.8564	0.57	Q V				
3+55	2.8586	0.32	Q V				
4+ 0	2.8594	0.12	Q V				
4+ 5	2.8599	0.08	Q V				
4+10	2.8602	0.04	Q V				
4+15	2.8603	0.00	Q V				

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/10/23 File: vbuhex610.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Existing Condition (Area B) 10-year, 6 hr Storm
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1624.00(Ft.)
Length along longest watercourse measured to centroid = 1128.00(Ft.)
Length along longest watercourse = 0.308 Mi.
Length along longest watercourse measured to centroid = 0.214 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 22.7586 Ft./Mi.
Average Manning's 'N' = 0.035
Lag time = 0.165 Hr.
Lag time = 9.89 Min.
25% of lag time = 2.47 Min.
40% of lag time = 3.96 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	1.16	35.93

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	2.89	89.50

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.160(In)
Area Averaged 100-Year Rainfall = 2.890(In)

Point rain (area averaged) = 1.872(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.872(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
29.140	92.00	0.000
1.830	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
92.0	92.0	0.104	0.000	0.104	0.941	0.098
92.0	92.0	0.104	0.650	0.043	0.059	0.003
					Sum (F) =	0.100

Area averaged mean soil loss (F) (In/Hr) = 0.100
Minimum soil loss rate ((In/Hr)) = 0.050
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	50.547	6.228	1.944
2	0.167	101.095	26.617	8.308
3	0.250	151.642	28.792	8.987
4	0.333	202.190	12.761	3.983
5	0.417	252.737	6.744	2.105
6	0.500	303.284	4.695	1.465
7	0.583	353.832	3.374	1.053
8	0.667	404.379	2.567	0.801
9	0.750	454.927	1.870	0.584
10	0.833	505.474	1.555	0.485
11	0.917	556.021	1.271	0.397
12	1.000	606.569	0.987	0.308
13	1.083	657.116	0.782	0.244
14	1.167	707.664	0.580	0.181
15	1.250	758.211	0.505	0.158
16	1.333	808.758	0.671	0.209
		Sum = 100.000	Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.08	0.50	0.112	0.100	(0.101)	0.012

2	0.17	0.60	0.135	0.100	(0.121)	0.034
3	0.25	0.60	0.135	0.100	(0.121)	0.034
4	0.33	0.60	0.135	0.100	(0.121)	0.034
5	0.42	0.60	0.135	0.100	(0.121)	0.034
6	0.50	0.70	0.157	0.100	(0.141)	0.057
7	0.58	0.70	0.157	0.100	(0.141)	0.057
8	0.67	0.70	0.157	0.100	(0.141)	0.057
9	0.75	0.70	0.157	0.100	(0.141)	0.057
10	0.83	0.70	0.157	0.100	(0.141)	0.057
11	0.92	0.70	0.157	0.100	(0.141)	0.057
12	1.00	0.80	0.180	0.100	(0.162)	0.079
13	1.08	0.80	0.180	0.100	(0.162)	0.079
14	1.17	0.80	0.180	0.100	(0.162)	0.079
15	1.25	0.80	0.180	0.100	(0.162)	0.079
16	1.33	0.80	0.180	0.100	(0.162)	0.079
17	1.42	0.80	0.180	0.100	(0.162)	0.079
18	1.50	0.80	0.180	0.100	(0.162)	0.079
19	1.58	0.80	0.180	0.100	(0.162)	0.079
20	1.67	0.80	0.180	0.100	(0.162)	0.079
21	1.75	0.80	0.180	0.100	(0.162)	0.079
22	1.83	0.80	0.180	0.100	(0.162)	0.079
23	1.92	0.80	0.180	0.100	(0.162)	0.079
24	2.00	0.90	0.202	0.100	(0.182)	0.102
25	2.08	0.80	0.180	0.100	(0.162)	0.079
26	2.17	0.90	0.202	0.100	(0.182)	0.102
27	2.25	0.90	0.202	0.100	(0.182)	0.102
28	2.33	0.90	0.202	0.100	(0.182)	0.102
29	2.42	0.90	0.202	0.100	(0.182)	0.102
30	2.50	0.90	0.202	0.100	(0.182)	0.102
31	2.58	0.90	0.202	0.100	(0.182)	0.102
32	2.67	0.90	0.202	0.100	(0.182)	0.102
33	2.75	1.00	0.225	0.100	(0.202)	0.124
34	2.83	1.00	0.225	0.100	(0.202)	0.124
35	2.92	1.00	0.225	0.100	(0.202)	0.124
36	3.00	1.00	0.225	0.100	(0.202)	0.124
37	3.08	1.00	0.225	0.100	(0.202)	0.124
38	3.17	1.10	0.247	0.100	(0.222)	0.147
39	3.25	1.10	0.247	0.100	(0.222)	0.147
40	3.33	1.10	0.247	0.100	(0.222)	0.147
41	3.42	1.20	0.270	0.100	(0.243)	0.169
42	3.50	1.30	0.292	0.100	(0.263)	0.192
43	3.58	1.40	0.314	0.100	(0.283)	0.214
44	3.67	1.40	0.314	0.100	(0.283)	0.214
45	3.75	1.50	0.337	0.100	(0.303)	0.236
46	3.83	1.50	0.337	0.100	(0.303)	0.236
47	3.92	1.60	0.359	0.100	(0.323)	0.259
48	4.00	1.60	0.359	0.100	(0.323)	0.259
49	4.08	1.70	0.382	0.100	(0.344)	0.281
50	4.17	1.80	0.404	0.100	(0.364)	0.304
51	4.25	1.90	0.427	0.100	(0.384)	0.326
52	4.33	2.00	0.449	0.100	(0.404)	0.349
53	4.42	2.10	0.472	0.100	(0.424)	0.371
54	4.50	2.10	0.472	0.100	(0.424)	0.371
55	4.58	2.20	0.494	0.100	(0.445)	0.394
56	4.67	2.30	0.517	0.100	(0.465)	0.416
57	4.75	2.40	0.539	0.100	(0.485)	0.439
58	4.83	2.40	0.539	0.100	(0.485)	0.439
59	4.92	2.50	0.561	0.100	(0.505)	0.461
60	5.00	2.60	0.584	0.100	(0.526)	0.484
61	5.08	3.10	0.696	0.100	(0.627)	0.596
62	5.17	3.60	0.809	0.100	(0.728)	0.708
63	5.25	3.90	0.876	0.100	(0.788)	0.775
64	5.33	4.20	0.943	0.100	(0.849)	0.843
65	5.42	4.70	1.056	0.100	(0.950)	0.955
66	5.50	5.60	1.258	0.100	(1.132)	1.157
67	5.58	1.90	0.427	0.100	(0.384)	0.326
68	5.67	0.90	0.202	0.100	(0.182)	0.102
69	5.75	0.60	0.135	0.100	(0.121)	0.034
70	5.83	0.50	0.112	0.100	(0.101)	0.012
71	5.92	0.30	0.067	(0.100)	0.061	0.007
72	6.00	0.20	0.045	(0.100)	0.040	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 15.3

Flood volume = Effective rainfall 1.28(In)
times area 31.0(Ac.)/[(In)/(Ft.)] = 3.3(Ac.Ft)
Total soil loss = 0.59(In)
Total soil loss = 1.533(Ac.Ft)
Total rainfall = 1.87(In)
Flood volume = 143608.8 Cubic Feet
Total soil loss = 66791.4 Cubic Feet

Peak flow rate of this hydrograph = 26.967(CFS)

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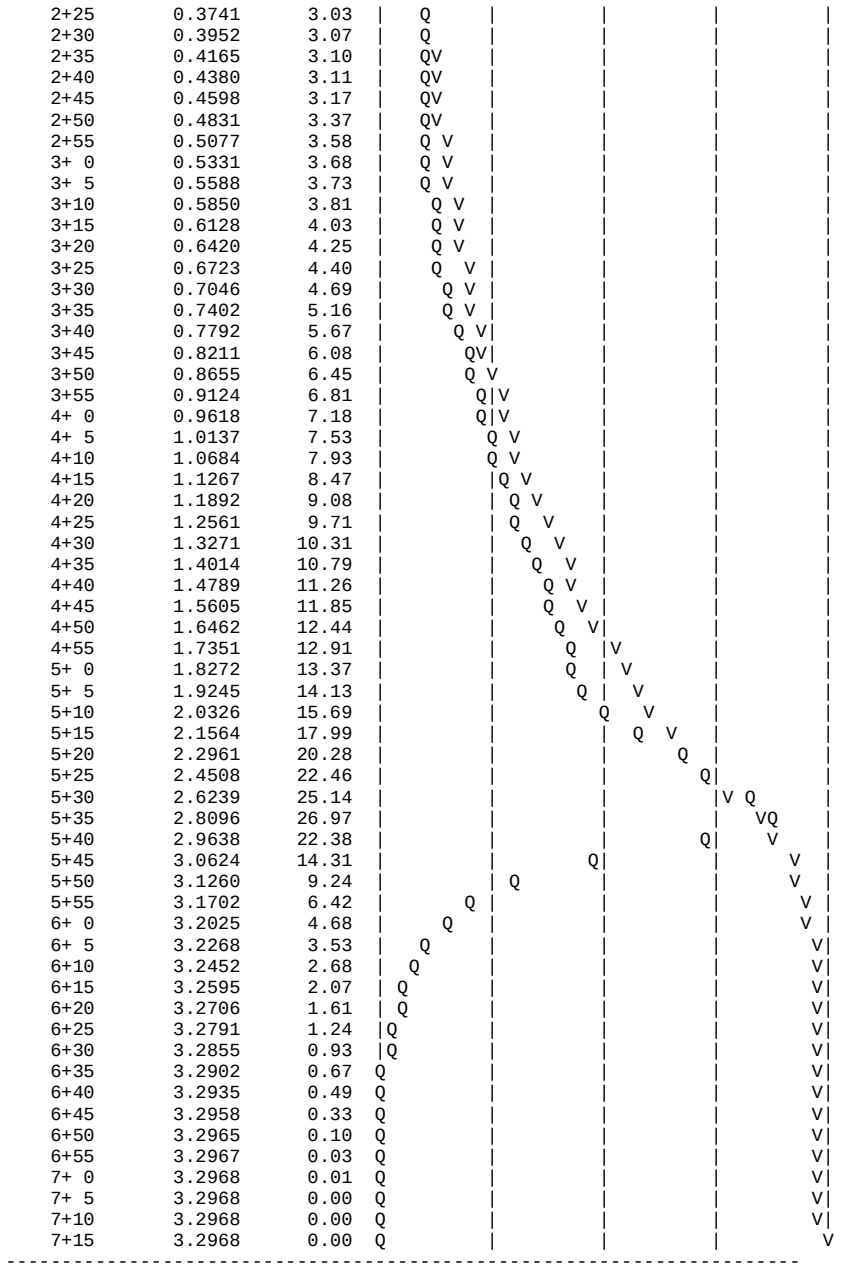
6 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0002	0.02	Q	|	|	|	|
0+10	0.0013	0.17	Q	|	|	|	|
0+15	0.0045	0.46	Q	|	|	|	|
0+20	0.0093	0.71	Q	|	|	|	|
0+25	0.0150	0.82	VQ	|	|	|	|
0+30	0.0214	0.93	VQ	|	|	|	|
0+35	0.0294	1.16	VQ	|	|	|	|
0+40	0.0391	1.40	VQ	|	|	|	|
0+45	0.0495	1.51	V Q	|	|	|	|
0+50	0.0604	1.58	V Q	|	|	|	|
0+55	0.0716	1.63	V Q	|	|	|	|
1+ 0	0.0833	1.71	|VQ	|	|	|	|
1+ 5	0.0966	1.92	|VQ	|	|	|	|
1+10	0.1114	2.14	|VQ	|	|	|	|
1+15	0.1269	2.25	|V Q	|	|	|	|
1+20	0.1428	2.31	|V Q	|	|	|	|
1+25	0.1590	2.36	|V Q	|	|	|	|
1+30	0.1755	2.39	| VQ	|	|	|	|
1+35	0.1921	2.41	| VQ	|	|	|	|
1+40	0.2088	2.43	| VQ	|	|	|	|
1+45	0.2256	2.44	| VQ	|	|	|	|
1+50	0.2425	2.45	| VQ	|	|	|	|
1+55	0.2594	2.46	| Q	|	|	|	|
2+ 0	0.2766	2.51	| Q	|	|	|	|
2+ 5	0.2949	2.65	| Q	|	|	|	|
2+10	0.3136	2.72	| Q	|	|	|	|
2+15	0.3329	2.80	| QV	|	|	|	|
2+20	0.3532	2.95	| QV	|	|	|	|



U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/10/23 File: vbuhex2410.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Existing Condition (Area B) 10-year, 24 hr Storm
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1624.00(Ft.)
Length along longest watercourse measured to centroid = 1128.00(Ft.)
Length along longest watercourse = 0.308 Mi.
Length along longest watercourse measured to centroid = 0.214 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 22.7586 Ft./Mi.
Average Manning's 'N' = 0.035
Lag time = 0.165 Hr.
Lag time = 9.89 Min.
25% of lag time = 2.47 Min.
40% of lag time = 3.96 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	2.04	63.18

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	5.36	166.00

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 2.040(In)
Area Averaged 100-Year Rainfall = 5.360(In)

Point rain (area averaged) = 3.406(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 3.406(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
29.140	92.00	0.000
1.830	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
92.0	92.0	0.104	0.000	0.104	0.941	0.098
92.0	92.0	0.104	0.650	0.043	0.059	0.003
					Sum (F) =	0.100

Area averaged mean soil loss (F) (In/Hr) = 0.100
Minimum soil loss rate ((In/Hr)) = 0.050
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	50.547	6.228	1.944
2	0.167	101.095	26.617	8.308
3	0.250	151.642	28.792	8.987
4	0.333	202.190	12.761	3.983
5	0.417	252.737	6.744	2.105
6	0.500	303.284	4.695	1.465
7	0.583	353.832	3.374	1.053
8	0.667	404.379	2.567	0.801
9	0.750	454.927	1.870	0.584
10	0.833	505.474	1.555	0.485
11	0.917	556.021	1.271	0.397
12	1.000	606.569	0.987	0.308
13	1.083	657.116	0.782	0.244
14	1.167	707.664	0.580	0.181
15	1.250	758.211	0.505	0.158
16	1.333	808.758	0.671	0.209
		Sum = 100.000	Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.08	0.07	0.027	(0.178)	0.025	0.003

2	0.17	0.07	0.027	(0.177)	0.025	0.003
3	0.25	0.07	0.027	(0.177)	0.025	0.003
4	0.33	0.10	0.041	(0.176)	0.037	0.004
5	0.42	0.10	0.041	(0.175)	0.037	0.004
6	0.50	0.10	0.041	(0.175)	0.037	0.004
7	0.58	0.10	0.041	(0.174)	0.037	0.004
8	0.67	0.10	0.041	(0.173)	0.037	0.004
9	0.75	0.10	0.041	(0.173)	0.037	0.004
10	0.83	0.13	0.054	(0.172)	0.049	0.005
11	0.92	0.13	0.054	(0.171)	0.049	0.005
12	1.00	0.13	0.054	(0.170)	0.049	0.005
13	1.08	0.10	0.041	(0.170)	0.037	0.004
14	1.17	0.10	0.041	(0.169)	0.037	0.004
15	1.25	0.10	0.041	(0.168)	0.037	0.004
16	1.33	0.10	0.041	(0.168)	0.037	0.004
17	1.42	0.10	0.041	(0.167)	0.037	0.004
18	1.50	0.10	0.041	(0.166)	0.037	0.004
19	1.58	0.10	0.041	(0.166)	0.037	0.004
20	1.67	0.10	0.041	(0.165)	0.037	0.004
21	1.75	0.10	0.041	(0.164)	0.037	0.004
22	1.83	0.13	0.054	(0.164)	0.049	0.005
23	1.92	0.13	0.054	(0.163)	0.049	0.005
24	2.00	0.13	0.054	(0.162)	0.049	0.005
25	2.08	0.13	0.054	(0.162)	0.049	0.005
26	2.17	0.13	0.054	(0.161)	0.049	0.005
27	2.25	0.13	0.054	(0.161)	0.049	0.005
28	2.33	0.13	0.054	(0.160)	0.049	0.005
29	2.42	0.13	0.054	(0.159)	0.049	0.005
30	2.50	0.13	0.054	(0.159)	0.049	0.005
31	2.58	0.17	0.068	(0.158)	0.061	0.007
32	2.67	0.17	0.068	(0.157)	0.061	0.007
33	2.75	0.17	0.068	(0.157)	0.061	0.007
34	2.83	0.17	0.068	(0.156)	0.061	0.007
35	2.92	0.17	0.068	(0.155)	0.061	0.007
36	3.00	0.17	0.068	(0.155)	0.061	0.007
37	3.08	0.17	0.068	(0.154)	0.061	0.007
38	3.17	0.17	0.068	(0.153)	0.061	0.007
39	3.25	0.17	0.068	(0.153)	0.061	0.007
40	3.33	0.17	0.068	(0.152)	0.061	0.007
41	3.42	0.17	0.068	(0.152)	0.061	0.007
42	3.50	0.17	0.068	(0.151)	0.061	0.007
43	3.58	0.17	0.068	(0.150)	0.061	0.007
44	3.67	0.17	0.068	(0.150)	0.061	0.007
45	3.75	0.17	0.068	(0.149)	0.061	0.007
46	3.83	0.20	0.082	(0.148)	0.074	0.008
47	3.92	0.20	0.082	(0.148)	0.074	0.008
48	4.00	0.20	0.082	(0.147)	0.074	0.008
49	4.08	0.20	0.082	(0.146)	0.074	0.008
50	4.17	0.20	0.082	(0.146)	0.074	0.008
51	4.25	0.20	0.082	(0.145)	0.074	0.008
52	4.33	0.23	0.095	(0.145)	0.086	0.010
53	4.42	0.23	0.095	(0.144)	0.086	0.010
54	4.50	0.23	0.095	(0.143)	0.086	0.010
55	4.58	0.23	0.095	(0.143)	0.086	0.010
56	4.67	0.23	0.095	(0.142)	0.086	0.010
57	4.75	0.23	0.095	(0.142)	0.086	0.010
58	4.83	0.27	0.109	(0.141)	0.098	0.011
59	4.92	0.27	0.109	(0.140)	0.098	0.011
60	5.00	0.27	0.109	(0.140)	0.098	0.011
61	5.08	0.20	0.082	(0.139)	0.074	0.008
62	5.17	0.20	0.082	(0.139)	0.074	0.008
63	5.25	0.20	0.082	(0.138)	0.074	0.008
64	5.33	0.23	0.095	(0.137)	0.086	0.010
65	5.42	0.23	0.095	(0.137)	0.086	0.010
66	5.50	0.23	0.095	(0.136)	0.086	0.010
67	5.58	0.27	0.109	(0.135)	0.098	0.011
68	5.67	0.27	0.109	(0.135)	0.098	0.011
69	5.75	0.27	0.109	(0.134)	0.098	0.011
70	5.83	0.27	0.109	(0.134)	0.098	0.011
71	5.92	0.27	0.109	(0.133)	0.098	0.011
72	6.00	0.27	0.109	(0.133)	0.098	0.011
73	6.08	0.30	0.123	(0.132)	0.110	0.012
74	6.17	0.30	0.123	(0.131)	0.110	0.012
75	6.25	0.30	0.123	(0.131)	0.110	0.012
76	6.33	0.30	0.123	(0.130)	0.110	0.012
77	6.42	0.30	0.123	(0.130)	0.110	0.012
78	6.50	0.30	0.123	(0.129)	0.110	0.012
79	6.58	0.33	0.136	(0.128)	0.123	0.014
80	6.67	0.33	0.136	(0.128)	0.123	0.014
81	6.75	0.33	0.136	(0.127)	0.123	0.014
82	6.83	0.33	0.136	(0.127)	0.123	0.014
83	6.92	0.33	0.136	(0.126)	0.123	0.014
84	7.00	0.33	0.136	(0.126)	0.123	0.014
85	7.08	0.33	0.136	(0.125)	0.123	0.014
86	7.17	0.33	0.136	(0.124)	0.123	0.014
87	7.25	0.33	0.136	(0.124)	0.123	0.014
88	7.33	0.37	0.150	0.123	(0.135)	0.027
89	7.42	0.37	0.150	0.123	(0.135)	0.027
90	7.50	0.37	0.150	0.122	(0.135)	0.028
91	7.58	0.40	0.163	0.122	(0.147)	0.042
92	7.67	0.40	0.163	0.121	(0.147)	0.042
93	7.75	0.40	0.163	0.120	(0.147)	0.043
94	7.83	0.43	0.177	0.120	(0.159)	0.057
95	7.92	0.43	0.177	0.119	(0.159)	0.058
96	8.00	0.43	0.177	0.119	(0.159)	0.058
97	8.08	0.50	0.204	0.118	(0.184)	0.086
98	8.17	0.50	0.204	0.118	(0.184)	0.087
99	8.25	0.50	0.204	0.117	(0.184)	0.087
100	8.33	0.50	0.204	0.117	(0.184)	0.088
101	8.42	0.50	0.204	0.116	(0.184)	0.088
102	8.50	0.50	0.204	0.116	(0.184)	0.089
103	8.58	0.53	0.218	0.115	(0.196)	0.103
104	8.67	0.53	0.218	0.114	(0.196)	0.104
105	8.75	0.53	0.218	0.114	(0.196)	0.104
106	8.83	0.57	0.232	0.113	(0.208)	0.118
107	8.92	0.57	0.232	0.113	(0.208)	0.119
108	9.00	0.57	0.232	0.112	(0.208)	0.119
109	9.08	0.63	0.259	0.112	(0.233)	0.147
110	9.17	0.63	0.259	0.111	(0.233)	0.148
111	9.25	0.63	0.259	0.111	(0.233)	0.148
112	9.33	0.67	0.272	0.110	(0.245)	0.162
113	9.42	0.67	0.272	0.110	(0.245)	0.163
114	9.50	0.67	0.272	0.109	(0.245)	0.163
115	9.58	0.70	0.286	0.109	(0.257)	0.177
116	9.67	0.70	0.286	0.108	(0.257)	0.178
117	9.75	0.70	0.286	0.108	(0.257)	0.179
118	9.83	0.73	0.300	0.107	(0.270)	0.193
119	9.92	0.73	0.300	0.107	(0.270)	0.193
120	10.00	0.73	0.300	0.106	(0.270)	0.194
121	10.08	0.50	0.204	0.106	(0.184)	0.099

122	10.17	0.50	0.204	0.105	(0.184)	0.099
123	10.25	0.50	0.204	0.104	(0.184)	0.100
124	10.33	0.50	0.204	0.104	(0.184)	0.100
125	10.42	0.50	0.204	0.103	(0.184)	0.101
126	10.50	0.50	0.204	0.103	(0.184)	0.101
127	10.58	0.67	0.272	0.102	(0.245)	0.170
128	10.67	0.67	0.272	0.102	(0.245)	0.170
129	10.75	0.67	0.272	0.101	(0.245)	0.171
130	10.83	0.67	0.272	0.101	(0.245)	0.171
131	10.92	0.67	0.272	0.100	(0.245)	0.172
132	11.00	0.67	0.272	0.100	(0.245)	0.172
133	11.08	0.63	0.259	0.099	(0.233)	0.159
134	11.17	0.63	0.259	0.099	(0.233)	0.160
135	11.25	0.63	0.259	0.099	(0.233)	0.160
136	11.33	0.63	0.259	0.098	(0.233)	0.161
137	11.42	0.63	0.259	0.098	(0.233)	0.161
138	11.50	0.63	0.259	0.097	(0.233)	0.162
139	11.58	0.57	0.232	0.097	(0.208)	0.135
140	11.67	0.57	0.232	0.096	(0.208)	0.135
141	11.75	0.57	0.232	0.096	(0.208)	0.136
142	11.83	0.60	0.245	0.095	(0.221)	0.150
143	11.92	0.60	0.245	0.095	(0.221)	0.151
144	12.00	0.60	0.245	0.094	(0.221)	0.151
145	12.08	0.83	0.341	0.094	(0.307)	0.247
146	12.17	0.83	0.341	0.093	(0.307)	0.247
147	12.25	0.83	0.341	0.093	(0.307)	0.248
148	12.33	0.87	0.354	0.092	(0.319)	0.262
149	12.42	0.87	0.354	0.092	(0.319)	0.262
150	12.50	0.87	0.354	0.091	(0.319)	0.263
151	12.58	0.93	0.381	0.091	(0.343)	0.290
152	12.67	0.93	0.381	0.090	(0.343)	0.291
153	12.75	0.93	0.381	0.090	(0.343)	0.291
154	12.83	0.97	0.395	0.090	(0.356)	0.305
155	12.92	0.97	0.395	0.089	(0.356)	0.306
156	13.00	0.97	0.395	0.089	(0.356)	0.306
157	13.08	1.13	0.463	0.088	(0.417)	0.375
158	13.17	1.13	0.463	0.088	(0.417)	0.375
159	13.25	1.13	0.463	0.087	(0.417)	0.376
160	13.33	1.13	0.463	0.087	(0.417)	0.376
161	13.42	1.13	0.463	0.086	(0.417)	0.377
162	13.50	1.13	0.463	0.086	(0.417)	0.377
163	13.58	0.77	0.313	0.086	(0.282)	0.228
164	13.67	0.77	0.313	0.085	(0.282)	0.228
165	13.75	0.77	0.313	0.085	(0.282)	0.229
166	13.83	0.77	0.313	0.084	(0.282)	0.229
167	13.92	0.77	0.313	0.084	(0.282)	0.229
168	14.00	0.77	0.313	0.083	(0.282)	0.230
169	14.08	0.90	0.368	0.083	(0.331)	0.285
170	14.17	0.90	0.368	0.083	(0.331)	0.285
171	14.25	0.90	0.368	0.082	(0.331)	0.286
172	14.33	0.87	0.354	0.082	(0.319)	0.272
173	14.42	0.87	0.354	0.081	(0.319)	0.273
174	14.50	0.87	0.354	0.081	(0.319)	0.273
175	14.58	0.87	0.354	0.080	(0.319)	0.274
176	14.67	0.87	0.354	0.080	(0.319)	0.274
177	14.75	0.87	0.354	0.080	(0.319)	0.275
178	14.83	0.83	0.341	0.079	(0.307)	0.261
179	14.92	0.83	0.341	0.079	(0.307)	0.262
180	15.00	0.83	0.341	0.078	(0.307)	0.262
181	15.08	0.80	0.327	0.078	(0.294)	0.249
182	15.17	0.80	0.327	0.078	(0.294)	0.249
183	15.25	0.80	0.327	0.077	(0.294)	0.250
184	15.33	0.77	0.313	0.077	(0.282)	0.236
185	15.42	0.77	0.313	0.076	(0.282)	0.237
186	15.50	0.77	0.313	0.076	(0.282)	0.237
187	15.58	0.63	0.259	0.076	(0.233)	0.183
188	15.67	0.63	0.259	0.075	(0.233)	0.184
189	15.75	0.63	0.259	0.075	(0.233)	0.184
190	15.83	0.63	0.259	0.074	(0.233)	0.184
191	15.92	0.63	0.259	0.074	(0.233)	0.185
192	16.00	0.63	0.259	0.074	(0.233)	0.185
193	16.08	0.13	0.054	(0.073)	0.049	0.005
194	16.17	0.13	0.054	(0.073)	0.049	0.005
195	16.25	0.13	0.054	(0.073)	0.049	0.005
196	16.33	0.13	0.054	(0.072)	0.049	0.005
197	16.42	0.13	0.054	(0.072)	0.049	0.005
198	16.50	0.13	0.054	(0.072)	0.049	0.005
199	16.58	0.10	0.041	(0.071)	0.037	0.004
200	16.67	0.10	0.041	(0.071)	0.037	0.004
201	16.75	0.10	0.041	(0.070)	0.037	0.004
202	16.83	0.10	0.041	(0.070)	0.037	0.004
203	16.92	0.10	0.041	(0.070)	0.037	0.004
204	17.00	0.10	0.041	(0.069)	0.037	0.004
205	17.08	0.17	0.068	(0.069)	0.061	0.007
206	17.17	0.17	0.068	(0.069)	0.061	0.007
207	17.25	0.17	0.068	(0.068)	0.061	0.007
208	17.33	0.17	0.068	(0.068)	0.061	0.007
209	17.42	0.17	0.068	(0.068)	0.061	0.007
210	17.50	0.17	0.068	(0.067)	0.061	0.007
211	17.58	0.17	0.068	(0.067)	0.061	0.007
212	17.67	0.17	0.068	(0.067)	0.061	0.007
213	17.75	0.17	0.068	(0.066)	0.061	0.007
214	17.83	0.13	0.054	(0.066)	0.049	0.005
215	17.92	0.13	0.054	(0.066)	0.049	0.005
216	18.00	0.13	0.054	(0.065)	0.049	0.005
217	18.08	0.13	0.054	(0.065)	0.049	0.005
218	18.17	0.13	0.054	(0.065)	0.049	0.005
219	18.25	0.13	0.054	(0.064)	0.049	0.005
220	18.33	0.13	0.054	(0.064)	0.049	0.005
221	18.42	0.13	0.054	(0.064)	0.049	0.005
222	18.50	0.13	0.054	(0.063)	0.049	0.005
223	18.58	0.10	0.041	(0.063)	0.037	0.004
224	18.67	0.10	0.041	(0.063)	0.037	0.004
225	18.75	0.10	0.041	(0.063)	0.037	0.004
226	18.83	0.07	0.027	(0.062)	0.025	0.003
227	18.92	0.07	0.027	(0.062)	0.025	0.003
228	19.00	0.07	0.027	(0.062)	0.025	0.003
229	19.08	0.10	0.041	(0.061)	0.037	0.004
230	19.17	0.10	0.041	(0.061)	0.037	0.004
231	19.25	0.10	0.041	(0.061)	0.037	0.004
232	19.33	0.13	0.054	(0.060)	0.049	0.005
233	19.42	0.13	0.054	(0.060)	0.049	0.005
234	19.50	0.13	0.054	(0.060)	0.049	0.005
235	19.58	0.10	0.041	(0.060)	0.037	0.004
236	19.67	0.10	0.041	(0.059)	0.037	0.004
237	19.75	0.10	0.041	(0.059)	0.037	0.004
238	19.83	0.07	0.027	(0.059)	0.025	0.003
239	19.92	0.07	0.027	(0.059)	0.025	0.003
240	20.00	0.07	0.027	(0.058)	0.025	0.003
241	20.08	0.10	0.041	(0.058)	0.037	0.004

242	20.17	0.10	0.041	(0.058)	0.037	0.004
243	20.25	0.10	0.041	(0.058)	0.037	0.004
244	20.33	0.10	0.041	(0.057)	0.037	0.004
245	20.42	0.10	0.041	(0.057)	0.037	0.004
246	20.50	0.10	0.041	(0.057)	0.037	0.004
247	20.58	0.10	0.041	(0.057)	0.037	0.004
248	20.67	0.10	0.041	(0.056)	0.037	0.004
249	20.75	0.10	0.041	(0.056)	0.037	0.004
250	20.83	0.07	0.027	(0.056)	0.025	0.003
251	20.92	0.07	0.027	(0.056)	0.025	0.003
252	21.00	0.07	0.027	(0.055)	0.025	0.003
253	21.08	0.10	0.041	(0.055)	0.037	0.004
254	21.17	0.10	0.041	(0.055)	0.037	0.004
255	21.25	0.10	0.041	(0.055)	0.037	0.004
256	21.33	0.07	0.027	(0.055)	0.025	0.003
257	21.42	0.07	0.027	(0.054)	0.025	0.003
258	21.50	0.07	0.027	(0.054)	0.025	0.003
259	21.58	0.10	0.041	(0.054)	0.037	0.004
260	21.67	0.10	0.041	(0.054)	0.037	0.004
261	21.75	0.10	0.041	(0.054)	0.037	0.004
262	21.83	0.07	0.027	(0.053)	0.025	0.003
263	21.92	0.07	0.027	(0.053)	0.025	0.003
264	22.00	0.07	0.027	(0.053)	0.025	0.003
265	22.08	0.10	0.041	(0.053)	0.037	0.004
266	22.17	0.10	0.041	(0.053)	0.037	0.004
267	22.25	0.10	0.041	(0.052)	0.037	0.004
268	22.33	0.07	0.027	(0.052)	0.025	0.003
269	22.42	0.07	0.027	(0.052)	0.025	0.003
270	22.50	0.07	0.027	(0.052)	0.025	0.003
271	22.58	0.07	0.027	(0.052)	0.025	0.003
272	22.67	0.07	0.027	(0.052)	0.025	0.003
273	22.75	0.07	0.027	(0.052)	0.025	0.003
274	22.83	0.07	0.027	(0.051)	0.025	0.003
275	22.92	0.07	0.027	(0.051)	0.025	0.003
276	23.00	0.07	0.027	(0.051)	0.025	0.003
277	23.08	0.07	0.027	(0.051)	0.025	0.003
278	23.17	0.07	0.027	(0.051)	0.025	0.003
279	23.25	0.07	0.027	(0.051)	0.025	0.003
280	23.33	0.07	0.027	(0.051)	0.025	0.003
281	23.42	0.07	0.027	(0.051)	0.025	0.003
282	23.50	0.07	0.027	(0.051)	0.025	0.003
283	23.58	0.07	0.027	(0.050)	0.025	0.003
284	23.67	0.07	0.027	(0.050)	0.025	0.003
285	23.75	0.07	0.027	(0.050)	0.025	0.003
286	23.83	0.07	0.027	(0.050)	0.025	0.003
287	23.92	0.07	0.027	(0.050)	0.025	0.003
288	24.00	0.07	0.027	(0.050)	0.025	0.003

(Loss Rate Not Used)

Sum = 100.0 Sum = 20.9

Flood volume = Effective rainfall 1.75(In)
times area 31.0(Ac.)/[(In)/(Ft.)] = 4.5(Ac.Ft)
Total soil loss = 1.66(In)
Total soil loss = 4.285(Ac.Ft)
Total rainfall = 3.41(In)
Flood volume = 196218.9 Cubic Feet
Total soil loss = 186650.1 Cubic Feet

Peak flow rate of this hydrograph = 11.384(CFS)

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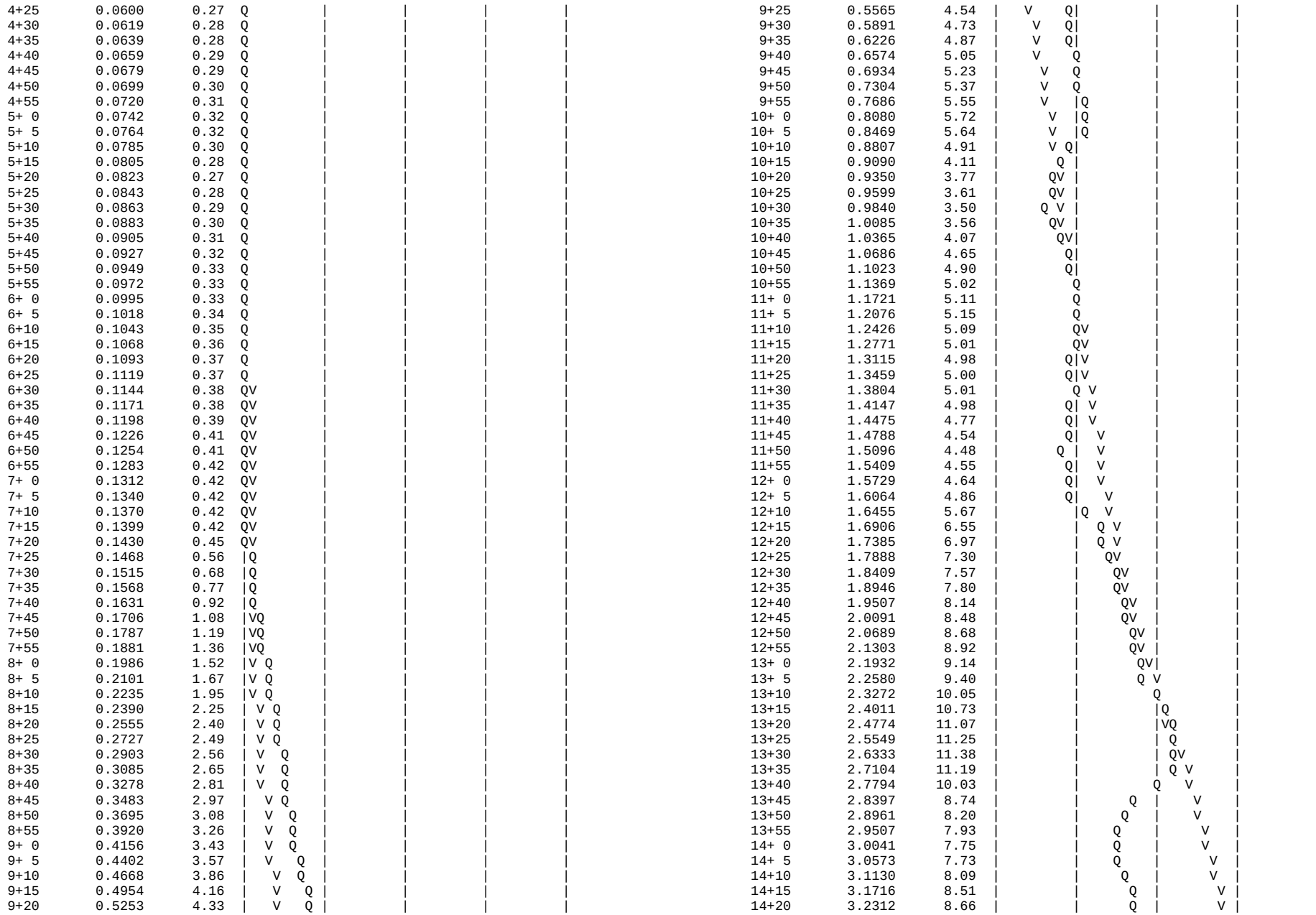
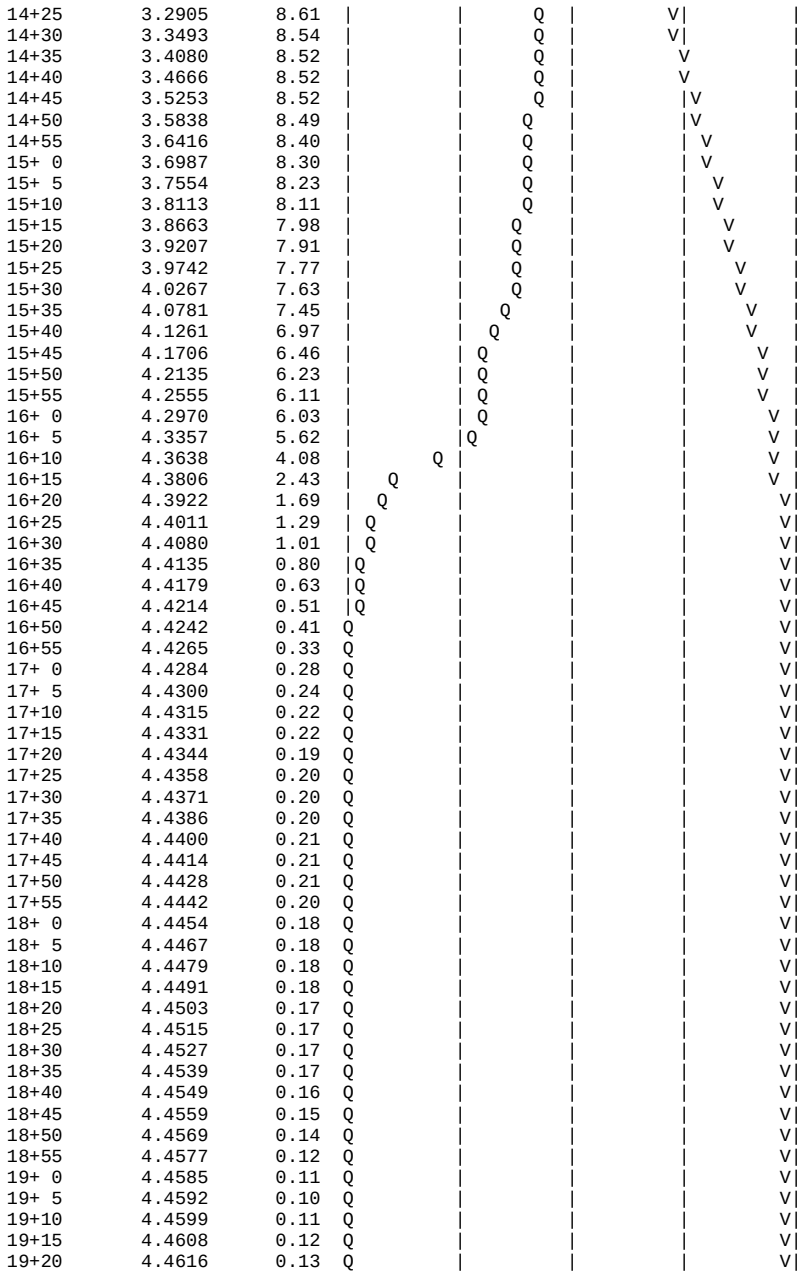
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0000	0.01	Q	|	|	|	|
0+10	0.0002	0.03	Q	|	|	|	|
0+15	0.0006	0.05	Q	|	|	|	|
0+20	0.0010	0.07	Q	|	|	|	|
0+25	0.0016	0.08	Q	|	|	|	|
0+30	0.0023	0.10	Q	|	|	|	|
0+35	0.0030	0.11	Q	|	|	|	|
0+40	0.0038	0.11	Q	|	|	|	|
0+45	0.0046	0.12	Q	|	|	|	|
0+50	0.0055	0.12	Q	|	|	|	|
0+55	0.0064	0.14	Q	|	|	|	|
1+ 0	0.0074	0.15	Q	|	|	|	|
1+ 5	0.0085	0.15	Q	|	|	|	|
1+10	0.0095	0.15	Q	|	|	|	|
1+15	0.0104	0.14	Q	|	|	|	|
1+20	0.0113	0.13	Q	|	|	|	|
1+25	0.0122	0.13	Q	|	|	|	|
1+30	0.0131	0.13	Q	|	|	|	|
1+35	0.0140	0.13	Q	|	|	|	|
1+40	0.0149	0.13	Q	|	|	|	|
1+45	0.0158	0.13	Q	|	|	|	|
1+50	0.0167	0.13	Q	|	|	|	|
1+55	0.0177	0.14	Q	|	|	|	|
2+ 0	0.0188	0.15	Q	|	|	|	|
2+ 5	0.0199	0.16	Q	|	|	|	|
2+10	0.0210	0.16	Q	|	|	|	|
2+15	0.0221	0.16	Q	|	|	|	|
2+20	0.0233	0.17	Q	|	|	|	|
2+25	0.0244	0.17	Q	|	|	|	|
2+30	0.0256	0.17	Q	|	|	|	|
2+35	0.0267	0.17	Q	|	|	|	|
2+40	0.0280	0.18	Q	|	|	|	|
2+45	0.0293	0.20	Q	|	|	|	|
2+50	0.0307	0.20	Q	|	|	|	|
2+55	0.0321	0.20	Q	|	|	|	|
3+ 0	0.0335	0.21	Q	|	|	|	|
3+ 5	0.0350	0.21	Q	|	|	|	|
3+10	0.0364	0.21	Q	|	|	|	|
3+15	0.0379	0.21	Q	|	|	|	|
3+20	0.0393	0.21	Q	|	|	|	|
3+25	0.0408	0.21	Q	|	|	|	|
3+30	0.0422	0.21	Q	|	|	|	|
3+35	0.0437	0.21	Q	|	|	|	|
3+40	0.0452	0.21	Q	|	|	|	|
3+45	0.0466	0.21	Q	|	|	|	|
3+50	0.0481	0.22	Q	|	|	|	|
3+55	0.0497	0.23	Q	|	|	|	|
4+ 0	0.0513	0.24	Q	|	|	|	|
4+ 5	0.0530	0.24	Q	|	|	|	|
4+10	0.0547	0.25	Q	|	|	|	|
4+15	0.0564	0.25	Q	|	|	|	|
4+20	0.0582	0.25	Q	|	|	|	|




14+25 3.2905 8.61
14+30 3.3493 8.54
14+35 3.4080 8.52
14+40 3.4666 8.52
14+45 3.5253 8.52
14+50 3.5838 8.49
14+55 3.6416 8.40
15+ 0 3.6987 8.30
15+ 5 3.7554 8.23
15+10 3.8113 8.11
15+15 3.8663 7.98
15+20 3.9207 7.91
15+25 3.9742 7.77
15+30 4.0267 7.63
15+35 4.0781 7.45
15+40 4.1261 6.97
15+45 4.1706 6.46
15+50 4.2135 6.23
15+55 4.2555 6.11
16+ 0 4.2970 6.03
16+ 5 4.3357 5.62
16+10 4.3638 4.08
16+15 4.3806 2.43
16+20 4.3922 1.69
16+25 4.4011 1.29
16+30 4.4080 1.01
16+35 4.4135 0.80
16+40 4.4179 0.63
16+45 4.4214 0.51
16+50 4.4242 0.41
16+55 4.4265 0.33
17+ 0 4.4284 0.28
17+ 5 4.4300 0.24
17+10 4.4315 0.22
17+15 4.4331 0.22
17+20 4.4344 0.19
17+25 4.4358 0.20
17+30 4.4371 0.20
17+35 4.4386 0.20
17+40 4.4400 0.21
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17+55 4.4442 0.20
18+ 0 4.4454 0.18
18+ 5 4.4467 0.18
18+10 4.4479 0.18
18+15 4.4491 0.18
18+20 4.4503 0.17
18+25 4.4515 0.17
18+30 4.4527 0.17
18+35 4.4539 0.17
18+40 4.4549 0.16
18+45 4.4559 0.15
18+50 4.4569 0.14
18+55 4.4577 0.12
19+ 0 4.4585 0.11
19+ 5 4.4592 0.10
19+10 4.4599 0.11
19+15 4.4608 0.12
19+20 4.4616 0.13
19+25 4.4626 0.14
19+30 4.4636 0.15
19+35 4.4647 0.15
19+40 4.4657 0.15
19+45 4.4667 0.14
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19+55 4.4684 0.12
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20+10 4.4705 0.11
20+15 4.4713 0.12
20+20 4.4722 0.12
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20+30 4.4739 0.13
20+35 4.4748 0.13
20+40 4.4756 0.13
20+45 4.4765 0.13
20+50 4.4773 0.12
20+55 4.4781 0.11
21+ 0 4.4788 0.10
21+ 5 4.4795 0.10
21+10 4.4802 0.11
21+15 4.4810 0.12
21+20 4.4818 0.12
21+25 4.4826 0.11
21+30 4.4833 0.10
21+35 4.4839 0.10
21+40 4.4847 0.11
21+45 4.4855 0.12
21+50 4.4863 0.12
21+55 4.4870 0.11
22+ 0 4.4877 0.10
22+ 5 4.4883 0.10
22+10 4.4891 0.10
22+15 4.4898 0.12
22+20 4.4907 0.12
22+25 4.4914 0.11
22+30 4.4921 0.10
22+35 4.4927 0.09
22+40 4.4933 0.09
22+45 4.4939 0.09
22+50 4.4946 0.09
22+55 4.4952 0.09
23+ 0 4.4958 0.09
23+ 5 4.4964 0.09
23+10 4.4969 0.09
23+15 4.4975 0.09
23+20 4.4981 0.09
23+25 4.4987 0.09
23+30 4.4993 0.09
23+35 4.4999 0.09
23+40 4.5005 0.09
23+45 4.5011 0.09
23+50 4.5017 0.09
23+55 4.5022 0.09
24+ 0 4.5028 0.09
24+ 5 4.5034 0.08
24+10 4.5038 0.06
24+15 4.5040 0.03
24+20 4.5041 0.02

```
  24+25       4.5043      0.02  Q         |         |         |        V|
  24+30       4.5043      0.01  Q         |         |         |        V|
  24+35       4.5044      0.01  Q         |         |         |        V|
  24+40       4.5044      0.01  Q         |         |         |        V|
  24+45       4.5045      0.01  Q         |         |         |        V|
  24+50       4.5045      0.00  Q         |         |         |        V|
  24+55       4.5045      0.00  Q         |         |         |        V|
  25+ 0       4.5045      0.00  Q         |         |         |        V|
  25+ 5       4.5046      0.00  Q         |         |         |        V|
  25+10       4.5046      0.00  Q         |         |         |        V|
  25+15       4.5046      0.00  Q         |         |         |         V
-------------------------------------------------------------------------
```

100-YEAR, (1-HR, 3-HR, 6-HR, & 24HR) STORMS

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/10/23 File: vbuhex1100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Existing Condition (Area B) 100yr, 1hr Storm
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1624.00(Ft.)
Length along longest watercourse measured to centroid = 1128.00(Ft.)
Length along longest watercourse = 0.308 Mi.
Length along longest watercourse measured to centroid = 0.214 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 22.7586 Ft./Mi.
Average Manning's 'N' = 0.035
Lag time = 0.165 Hr.
Lag time = 9.89 Min.
25% of lag time = 2.47 Min.
40% of lag time = 3.96 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	0.49	15.05

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	1.65	51.10

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.486(In)
Area Averaged 100-Year Rainfall = 1.650(In)

Point rain (area averaged) = 1.650(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 1.650(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
29.140	92.00	0.000
1.830	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
92.0	96.8	0.042	0.000	0.042	0.941	0.039
92.0	96.8	0.042	0.650	0.017	0.059	0.001
					Sum (F) =	0.040

Area averaged mean soil loss (F) (In/Hr) = 0.040
Minimum soil loss rate ((In/Hr)) = 0.020
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm =0.5000

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	50.547	6.228	1.944
2	0.167	101.095	26.617	8.308
3	0.250	151.642	28.792	8.987
4	0.333	202.190	12.761	3.983
5	0.417	252.737	6.744	2.105
6	0.500	303.284	4.695	1.465
7	0.583	353.832	3.374	1.053
8	0.667	404.379	2.567	0.801
9	0.750	454.927	1.870	0.584
10	0.833	505.474	1.555	0.485
11	0.917	556.021	1.271	0.397
12	1.000	606.569	0.987	0.308
13	1.083	657.116	0.782	0.244
14	1.167	707.664	0.580	0.181
15	1.250	758.211	0.505	0.158
16	1.333	808.758	0.671	0.209
		Sum = 100.000	Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time	Pattern	Storm Rain	Loss rate(In./Hr)	Effective

```
    (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
 1   0.08     4.20      0.831          0.040    (  0.748)        0.791
 2   0.17     4.30      0.851          0.040    (  0.766)        0.811
 3   0.25     5.00      0.990          0.040    (  0.891)        0.950
 4   0.33     5.00      0.990          0.040    (  0.891)        0.950
 5   0.42     5.80      1.148          0.040    (  1.033)        1.108
 6   0.50     6.50      1.287          0.040    (  1.158)        1.246
 7   0.58     7.40      1.465          0.040    (  1.318)        1.425
 8   0.67     8.60      1.702          0.040    (  1.532)        1.662
 9   0.75    12.30      2.435          0.040    (  2.191)        2.395
10   0.83    29.10      5.760          0.040    (  5.184)        5.720
11   0.92     6.80      1.346          0.040    (  1.211)        1.306
12   1.00     5.00      0.990          0.040    (  0.891)        0.950
              (Loss Rate Not Used)
   Sum =     100.0                                  Sum =    19.3
      Flood volume = Effective rainfall      1.61(In)
       times area      31.0(Ac.)/[(In)/(Ft.)] =       4.2(Ac.Ft)
      Total soil loss =      0.04(In)
      Total soil loss =     0.104(Ac.Ft)
      Total rainfall =      1.65(In)
      Flood volume =      180927.7 Cubic Feet
      Total soil loss =        4515.1 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     86.257(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        1 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       22.5      45.0      67.5      90.0
-------------------------------------------------------------------------
  0+ 5       0.0106      1.54  Q         |         |         |         |
  0+10       0.0668      8.15  V  Q      |         |         |         |
  0+15       0.1749     15.70  |V    Q   |         |         |         |
  0+20       0.3139     20.18  |  V    Q |         |         |         |
  0+25       0.4756     23.48  |   V     Q         |         |         |
  0+30       0.6604     26.82  |     V   |Q        |         |         |
  0+35       0.8732     30.90  |       V |  Q      |         |         |
  0+40       1.1182     35.58  |         V    Q    |         |         |
  0+45       1.4081     42.09  |         |  V    Q |         |         |
  0+50       1.8111     58.52  |         |      V  |     Q   |         |
  0+55       2.4051     86.26  |         |         |  V      |       Q |
  1+ 0       2.9771     83.05  |         |         |       V |     Q   |
  1+ 5       3.3513     54.34  |         |         |   Q     | V       |
  1+10       3.5887     34.47  |         |    Q    |         |   V     |
  1+15       3.7364     21.45  |        Q|         |         |    V    |
  1+20       3.8401     15.06  |     Q   |         |         |     V   |
  1+25       3.9177     11.27  |    Q    |         |         |      V  |
  1+30       3.9763      8.50  |  Q      |         |         |       V |
  1+35       4.0225      6.71  | Q       |         |         |       V |
  1+40       4.0590      5.29  | Q       |         |         |        V|
  1+45       4.0873      4.11  |Q        |         |         |        V|
  1+50       4.1091      3.17  |Q        |         |         |        V|
  1+55       4.1255      2.37  |Q        |         |         |        V|
  2+ 0       4.1384      1.87  Q         |         |         |        V|
  2+ 5       4.1492      1.58  Q         |         |         |        V|
  2+10       4.1522      0.42  Q         |         |         |        V|
  2+15       4.1535      0.20  Q         |         |         |        V|
-------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/10/23 File: vbuhex3100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Existing Condition (Area B) 100yr, 3hr Storm
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1624.00(Ft.)
Length along longest watercourse measured to centroid = 1128.00(Ft.)
Length along longest watercourse = 0.308 Mi.
Length along longest watercourse measured to centroid = 0.214 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 22.7586 Ft./Mi.
Average Manning's 'N' = 0.035
Lag time = 0.165 Hr.
Lag time = 9.89 Min.
25% of lag time = 2.47 Min.
40% of lag time = 3.96 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	0.83	25.86

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	2.23	69.06

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.835(In)
Area Averaged 100-Year Rainfall = 2.230(In)

Point rain (area averaged) = 2.230(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 2.230(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
29.140	92.00	0.000
1.830	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
92.0	96.8	0.042	0.000	0.042	0.941	0.039
92.0	96.8	0.042	0.650	0.017	0.059	0.001
					Sum (F) =	0.040

Area averaged mean soil loss (F) (In/Hr) = 0.040
Minimum soil loss rate ((In/Hr)) = 0.020
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	50.547	6.228	1.944
2	0.167	101.095	26.617	8.308
3	0.250	151.642	28.792	8.987
4	0.333	202.190	12.761	3.983
5	0.417	252.737	6.744	2.105
6	0.500	303.284	4.695	1.465
7	0.583	353.832	3.374	1.053
8	0.667	404.379	2.567	0.801
9	0.750	454.927	1.870	0.584
10	0.833	505.474	1.555	0.485
11	0.917	556.021	1.271	0.397
12	1.000	606.569	0.987	0.308
13	1.083	657.116	0.782	0.244
14	1.167	707.664	0.580	0.181
15	1.250	758.211	0.505	0.158
16	1.333	808.758	0.671	0.209
		Sum = 100.000	Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.348	0.040	(0.313)	0.308

2	0.17	1.30	0.348	0.040	(0.313)	0.308
3	0.25	1.10	0.294	0.040	(0.265)	0.254
4	0.33	1.50	0.401	0.040	(0.361)	0.361
5	0.42	1.50	0.401	0.040	(0.361)	0.361
6	0.50	1.80	0.482	0.040	(0.433)	0.441
7	0.58	1.50	0.401	0.040	(0.361)	0.361
8	0.67	1.80	0.482	0.040	(0.433)	0.441
9	0.75	1.80	0.482	0.040	(0.433)	0.441
10	0.83	1.50	0.401	0.040	(0.361)	0.361
11	0.92	1.60	0.428	0.040	(0.385)	0.388
12	1.00	1.80	0.482	0.040	(0.433)	0.441
13	1.08	2.20	0.589	0.040	(0.530)	0.548
14	1.17	2.20	0.589	0.040	(0.530)	0.548
15	1.25	2.20	0.589	0.040	(0.530)	0.548
16	1.33	2.00	0.535	0.040	(0.482)	0.495
17	1.42	2.60	0.696	0.040	(0.626)	0.656
18	1.50	2.70	0.722	0.040	(0.650)	0.682
19	1.58	2.40	0.642	0.040	(0.578)	0.602
20	1.67	2.70	0.722	0.040	(0.650)	0.682
21	1.75	3.30	0.883	0.040	(0.795)	0.843
22	1.83	3.10	0.829	0.040	(0.747)	0.789
23	1.92	2.90	0.776	0.040	(0.698)	0.736
24	2.00	3.00	0.803	0.040	(0.722)	0.763
25	2.08	3.10	0.829	0.040	(0.747)	0.789
26	2.17	4.20	1.124	0.040	(1.011)	1.084
27	2.25	5.00	1.338	0.040	(1.204)	1.298
28	2.33	3.50	0.936	0.040	(0.843)	0.896
29	2.42	6.80	1.819	0.040	(1.637)	1.779
30	2.50	7.30	1.953	0.040	(1.758)	1.913
31	2.58	8.20	2.194	0.040	(1.975)	2.154
32	2.67	5.90	1.579	0.040	(1.421)	1.538
33	2.75	2.00	0.535	0.040	(0.482)	0.495
34	2.83	1.80	0.482	0.040	(0.433)	0.441
35	2.92	1.80	0.482	0.040	(0.433)	0.441
36	3.00	0.60	0.161	0.040	(0.144)	0.120

(Loss Rate Not Used)

Sum = 100.0 Sum = 25.3

Flood volume = Effective rainfall 2.11(In)
times area 31.0(Ac.)/[(In)/(Ft.)] = 5.4(Ac.Ft)
Total soil loss = 0.12(In)
Total soil loss = 0.311(Ac.Ft)
Total rainfall = 2.23(In)
Flood volume = 237119.9 Cubic Feet
Total soil loss = 13545.2 Cubic Feet

Peak flow rate of this hydrograph = 52.647(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	15.0	30.0	45.0	60.0
0+ 5	0.0041	0.60	Q				
0+10	0.0259	3.16	V Q				
0+15	0.0659	5.82	V Q				
0+20	0.1128	6.81	V Q				
0+25	0.1670	7.86	V Q				
0+30	0.2305	9.22	V Q				
0+35	0.3019	10.37	V Q				
0+40	0.3775	10.97	V Q				
0+45	0.4568	11.52	V Q				
0+50	0.5405	12.15	V Q				
0+55	0.6230	11.98	V Q				
1+ 0	0.7047	11.86	V Q				
1+ 5	0.7917	12.63	V Q				
1+10	0.8887	14.09	V Q				
1+15	0.9943	15.33	V Q				
1+20	1.1033	15.84	V Q				
1+25	1.2136	16.02	V Q				
1+30	1.3317	17.14	V Q				
1+35	1.4599	18.61	V Q				
1+40	1.5907	18.99	VQ				
1+45	1.7263	19.70	VQ				
1+50	1.8753	21.63	VQ				
1+55	2.0331	22.91	VQ				
2+ 0	2.1907	22.89	QV				
2+ 5	2.3487	22.95	Q V				
2+10	2.5142	24.02	Q V				
2+15	2.7023	27.32	QV				
2+20	2.9172	31.19	QV				
2+25	3.1431	32.81	Q V				
2+30	3.4074	38.38	Q				
2+35	3.7329	47.26	V Q				
2+40	4.0955	52.65	V Q				
2+45	4.4396	49.97	VQ				
2+50	4.7023	38.14	Q V				
2+55	4.8915	27.47	Q V				
3+ 0	5.0439	22.13	Q V				
3+ 5	5.1594	16.77	Q V				
3+10	5.2370	11.26	Q V				
3+15	5.2905	7.78	Q V				
3+20	5.3305	5.81	Q V				
3+25	5.3615	4.51	Q V				
3+30	5.3853	3.46	Q V				
3+35	5.4031	2.58	Q V				
3+40	5.4173	2.05	Q V				
3+45	5.4277	1.51	Q V				
3+50	5.4351	1.08	Q V				
3+55	5.4394	0.63	Q V				
4+ 0	5.4413	0.28	Q V				
4+ 5	5.4426	0.18	Q V				
4+10	5.4434	0.11	Q V				
4+15	5.4435	0.03	Q V				

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/10/23 File: vbuhex6100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Existing Condition (Area B) 100yr, 6hr Storm
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1624.00(Ft.)
Length along longest watercourse measured to centroid = 1128.00(Ft.)
Length along longest watercourse = 0.308 Mi.
Length along longest watercourse measured to centroid = 0.214 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 22.7586 Ft./Mi.
Average Manning's 'N' = 0.035
Lag time = 0.165 Hr.
Lag time = 9.89 Min.
25% of lag time = 2.47 Min.
40% of lag time = 3.96 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	1.16	35.93

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	2.89	89.50

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.160(In)
Area Averaged 100-Year Rainfall = 2.890(In)

Point rain (area averaged) = 2.890(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 2.890(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
29.140	92.00	0.000
1.830	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
92.0	96.8	0.042	0.000	0.042	0.941	0.039
92.0	96.8	0.042	0.650	0.017	0.059	0.001
					Sum (F) =	0.040

Area averaged mean soil loss (F) (In/Hr) = 0.040
Minimum soil loss rate ((In/Hr)) = 0.020
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	50.547	6.228	1.944
2	0.167	101.095	26.617	8.308
3	0.250	151.642	28.792	8.987
4	0.333	202.190	12.761	3.983
5	0.417	252.737	6.744	2.105
6	0.500	303.284	4.695	1.465
7	0.583	353.832	3.374	1.053
8	0.667	404.379	2.567	0.801
9	0.750	454.927	1.870	0.584
10	0.833	505.474	1.555	0.485
11	0.917	556.021	1.271	0.397
12	1.000	606.569	0.987	0.308
13	1.083	657.116	0.782	0.244
14	1.167	707.664	0.580	0.181
15	1.250	758.211	0.505	0.158
16	1.333	808.758	0.671	0.209
		Sum = 100.000	Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.08	0.50	0.173	0.040	(0.156)	0.133

2	0.17	0.60	0.208	0.040	(0.187)	0.168
3	0.25	0.60	0.208	0.040	(0.187)	0.168
4	0.33	0.60	0.208	0.040	(0.187)	0.168
5	0.42	0.60	0.208	0.040	(0.187)	0.168
6	0.50	0.70	0.243	0.040	(0.218)	0.203
7	0.58	0.70	0.243	0.040	(0.218)	0.203
8	0.67	0.70	0.243	0.040	(0.218)	0.203
9	0.75	0.70	0.243	0.040	(0.218)	0.203
10	0.83	0.70	0.243	0.040	(0.218)	0.203
11	0.92	0.70	0.243	0.040	(0.218)	0.203
12	1.00	0.80	0.277	0.040	(0.250)	0.237
13	1.08	0.80	0.277	0.040	(0.250)	0.237
14	1.17	0.80	0.277	0.040	(0.250)	0.237
15	1.25	0.80	0.277	0.040	(0.250)	0.237
16	1.33	0.80	0.277	0.040	(0.250)	0.237
17	1.42	0.80	0.277	0.040	(0.250)	0.237
18	1.50	0.80	0.277	0.040	(0.250)	0.237
19	1.58	0.80	0.277	0.040	(0.250)	0.237
20	1.67	0.80	0.277	0.040	(0.250)	0.237
21	1.75	0.80	0.277	0.040	(0.250)	0.237
22	1.83	0.80	0.277	0.040	(0.250)	0.237
23	1.92	0.80	0.277	0.040	(0.250)	0.237
24	2.00	0.90	0.312	0.040	(0.281)	0.272
25	2.08	0.80	0.277	0.040	(0.250)	0.237
26	2.17	0.90	0.312	0.040	(0.281)	0.272
27	2.25	0.90	0.312	0.040	(0.281)	0.272
28	2.33	0.90	0.312	0.040	(0.281)	0.272
29	2.42	0.90	0.312	0.040	(0.281)	0.272
30	2.50	0.90	0.312	0.040	(0.281)	0.272
31	2.58	0.90	0.312	0.040	(0.281)	0.272
32	2.67	0.90	0.312	0.040	(0.281)	0.272
33	2.75	1.00	0.347	0.040	(0.312)	0.307
34	2.83	1.00	0.347	0.040	(0.312)	0.307
35	2.92	1.00	0.347	0.040	(0.312)	0.307
36	3.00	1.00	0.347	0.040	(0.312)	0.307
37	3.08	1.00	0.347	0.040	(0.312)	0.307
38	3.17	1.10	0.381	0.040	(0.343)	0.341
39	3.25	1.10	0.381	0.040	(0.343)	0.341
40	3.33	1.10	0.381	0.040	(0.343)	0.341
41	3.42	1.20	0.416	0.040	(0.375)	0.376
42	3.50	1.30	0.451	0.040	(0.406)	0.411
43	3.58	1.40	0.485	0.040	(0.437)	0.445
44	3.67	1.40	0.485	0.040	(0.437)	0.445
45	3.75	1.50	0.520	0.040	(0.468)	0.480
46	3.83	1.50	0.520	0.040	(0.468)	0.480
47	3.92	1.60	0.555	0.040	(0.499)	0.515
48	4.00	1.60	0.555	0.040	(0.499)	0.515
49	4.08	1.70	0.589	0.040	(0.531)	0.549
50	4.17	1.80	0.624	0.040	(0.562)	0.584
51	4.25	1.90	0.659	0.040	(0.593)	0.619
52	4.33	2.00	0.694	0.040	(0.624)	0.653
53	4.42	2.10	0.728	0.040	(0.655)	0.688
54	4.50	2.10	0.728	0.040	(0.655)	0.688
55	4.58	2.20	0.763	0.040	(0.687)	0.723
56	4.67	2.30	0.798	0.040	(0.718)	0.757
57	4.75	2.40	0.832	0.040	(0.749)	0.792
58	4.83	2.40	0.832	0.040	(0.749)	0.792
59	4.92	2.50	0.867	0.040	(0.780)	0.827
60	5.00	2.60	0.902	0.040	(0.811)	0.861
61	5.08	3.10	1.075	0.040	(0.967)	1.035
62	5.17	3.60	1.248	0.040	(1.124)	1.208
63	5.25	3.90	1.352	0.040	(1.217)	1.312
64	5.33	4.20	1.456	0.040	(1.311)	1.416
65	5.42	4.70	1.630	0.040	(1.467)	1.590
66	5.50	5.60	1.942	0.040	(1.748)	1.902
67	5.58	1.90	0.659	0.040	(0.593)	0.619
68	5.67	0.90	0.312	0.040	(0.281)	0.272
69	5.75	0.60	0.208	0.040	(0.187)	0.168
70	5.83	0.50	0.173	0.040	(0.156)	0.133
71	5.92	0.30	0.104	0.040	(0.094)	0.064
72	6.00	0.20	0.069	0.040	(0.062)	0.029

(Loss Rate Not Used)

Sum = 100.0 Sum = 31.8

Flood volume = Effective rainfall 2.65(In)
times area 31.0(Ac.)/[(In)/(Ft.)] = 6.8(Ac.Ft)
Total soil loss = 0.24(In)
Total soil loss = 0.622(Ac.Ft)
Total rainfall = 2.89(In)
Flood volume = 297772.1 Cubic Feet
Total soil loss = 27090.3 Cubic Feet

Peak flow rate of this hydrograph = 45.224(CFS)

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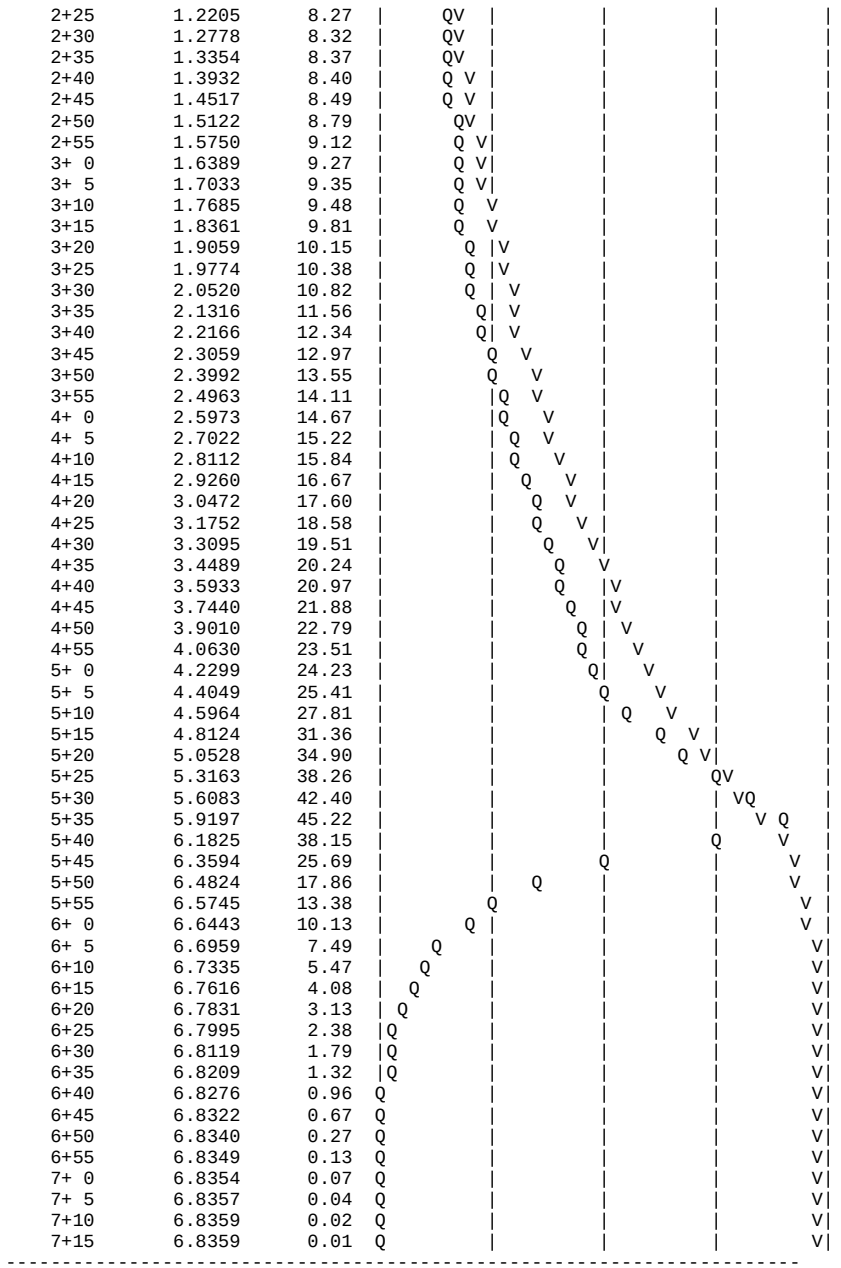
6 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0018	0.26	Q	|	|	|	|
0+10	0.0117	1.43	VQ	|	|	|	|
0+15	0.0318	2.92	V Q	|	|	|	|
0+20	0.0577	3.76	V Q	|	|	|	|
0+25	0.0865	4.18	V Q	|	|	|	|
0+30	0.1176	4.52	V Q	|	|	|	|
0+35	0.1520	5.00	V Q	|	|	|	|
0+40	0.1895	5.45	|V Q	|	|	|	|
0+45	0.2288	5.70	|V Q	|	|	|	|
0+50	0.2691	5.85	|V Q	|	|	|	|
0+55	0.3102	5.97	|V Q	|	|	|	|
1+ 0	0.3525	6.13	| V Q	|	|	|	|
1+ 5	0.3972	6.49	| V Q	|	|	|	|
1+10	0.4444	6.86	| V Q	|	|	|	|
1+15	0.4929	7.04	| V Q	|	|	|	|
1+20	0.5422	7.16	| V Q	|	|	|	|
1+25	0.5920	7.23	| V Q	|	|	|	|
1+30	0.6420	7.27	| V Q	|	|	|	|
1+35	0.6924	7.31	| VQ	|	|	|	|
1+40	0.7429	7.33	| VQ	|	|	|	|
1+45	0.7935	7.36	| VQ	|	|	|	|
1+50	0.8443	7.37	| VQ	|	|	|	|
1+55	0.8951	7.38	| Q	|	|	|	|
2+ 0	0.9465	7.46	| Q	|	|	|	|
2+ 5	0.9994	7.68	| VQ	|	|	|	|
2+10	1.0530	7.78	| Q	|	|	|	|
2+15	1.1074	7.90	| Q	|	|	|	|
2+20	1.1636	8.15	| Q	|	|	|	|



U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/10/23 File: vbuhex24100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Existing Condition (Area B) 100yr, 24hr Storm
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1624.00(Ft.)
Length along longest watercourse measured to centroid = 1128.00(Ft.)
Length along longest watercourse = 0.308 Mi.
Length along longest watercourse measured to centroid = 0.214 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 22.7586 Ft./Mi.
Average Manning's 'N' = 0.035
Lag time = 0.165 Hr.
Lag time = 9.89 Min.
25% of lag time = 2.47 Min.
40% of lag time = 3.96 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	2.04	63.18

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	5.36	166.00

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.040(In)
Area Averaged 100-Year Rainfall = 5.360(In)

Point rain (area averaged) = 5.360(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 5.360(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
29.140	92.00	0.000
1.830	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
92.0	96.8	0.042	0.000	0.042	0.941	0.039
92.0	96.8	0.042	0.650	0.017	0.059	0.001
					Sum (F) =	0.040

Area averaged mean soil loss (F) (In/Hr) = 0.040
Minimum soil loss rate ((In/Hr)) = 0.020
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	50.547	6.228	1.944
2	0.167	101.095	26.617	8.308
3	0.250	151.642	28.792	8.987
4	0.333	202.190	12.761	3.983
5	0.417	252.737	6.744	2.105
6	0.500	303.284	4.695	1.465
7	0.583	353.832	3.374	1.053
8	0.667	404.379	2.567	0.801
9	0.750	454.927	1.870	0.584
10	0.833	505.474	1.555	0.485
11	0.917	556.021	1.271	0.397
12	1.000	606.569	0.987	0.308
13	1.083	657.116	0.782	0.244
14	1.167	707.664	0.580	0.181
15	1.250	758.211	0.505	0.158
16	1.333	808.758	0.671	0.209
			Sum = 100.000 Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time	(Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.043	(0.071)	0.039	0.004

2	0.17	0.07	0.043	(0.071)	0.039	0.004
3	0.25	0.07	0.043	(0.071)	0.039	0.004
4	0.33	0.10	0.064	(0.070)	0.058	0.006
5	0.42	0.10	0.064	(0.070)	0.058	0.006
6	0.50	0.10	0.064	(0.070)	0.058	0.006
7	0.58	0.10	0.064	(0.070)	0.058	0.006
8	0.67	0.10	0.064	(0.069)	0.058	0.006
9	0.75	0.10	0.064	(0.069)	0.058	0.006
10	0.83	0.13	0.086	0.069	(0.077)	0.017
11	0.92	0.13	0.086	0.068	(0.077)	0.017
12	1.00	0.13	0.086	0.068	(0.077)	0.018
13	1.08	0.10	0.064	(0.068)	0.058	0.006
14	1.17	0.10	0.064	(0.068)	0.058	0.006
15	1.25	0.10	0.064	(0.067)	0.058	0.006
16	1.33	0.10	0.064	(0.067)	0.058	0.006
17	1.42	0.10	0.064	(0.067)	0.058	0.006
18	1.50	0.10	0.064	(0.067)	0.058	0.006
19	1.58	0.10	0.064	(0.066)	0.058	0.006
20	1.67	0.10	0.064	(0.066)	0.058	0.006
21	1.75	0.10	0.064	(0.066)	0.058	0.006
22	1.83	0.13	0.086	0.066	(0.077)	0.020
23	1.92	0.13	0.086	0.065	(0.077)	0.020
24	2.00	0.13	0.086	0.065	(0.077)	0.021
25	2.08	0.13	0.086	0.065	(0.077)	0.021
26	2.17	0.13	0.086	0.064	(0.077)	0.021
27	2.25	0.13	0.086	0.064	(0.077)	0.022
28	2.33	0.13	0.086	0.064	(0.077)	0.022
29	2.42	0.13	0.086	0.064	(0.077)	0.022
30	2.50	0.13	0.086	0.063	(0.077)	0.022
31	2.58	0.17	0.107	0.063	(0.096)	0.044
32	2.67	0.17	0.107	0.063	(0.096)	0.044
33	2.75	0.17	0.107	0.063	(0.096)	0.045
34	2.83	0.17	0.107	0.062	(0.096)	0.045
35	2.92	0.17	0.107	0.062	(0.096)	0.045
36	3.00	0.17	0.107	0.062	(0.096)	0.045
37	3.08	0.17	0.107	0.062	(0.096)	0.046
38	3.17	0.17	0.107	0.061	(0.096)	0.046
39	3.25	0.17	0.107	0.061	(0.096)	0.046
40	3.33	0.17	0.107	0.061	(0.096)	0.046
41	3.42	0.17	0.107	0.061	(0.096)	0.047
42	3.50	0.17	0.107	0.060	(0.096)	0.047
43	3.58	0.17	0.107	0.060	(0.096)	0.047
44	3.67	0.17	0.107	0.060	(0.096)	0.047
45	3.75	0.17	0.107	0.060	(0.096)	0.048
46	3.83	0.20	0.129	0.059	(0.116)	0.069
47	3.92	0.20	0.129	0.059	(0.116)	0.070
48	4.00	0.20	0.129	0.059	(0.116)	0.070
49	4.08	0.20	0.129	0.059	(0.116)	0.070
50	4.17	0.20	0.129	0.058	(0.116)	0.070
51	4.25	0.20	0.129	0.058	(0.116)	0.071
52	4.33	0.23	0.150	0.058	(0.135)	0.092
53	4.42	0.23	0.150	0.058	(0.135)	0.092
54	4.50	0.23	0.150	0.057	(0.135)	0.093
55	4.58	0.23	0.150	0.057	(0.135)	0.093
56	4.67	0.23	0.150	0.057	(0.135)	0.093
57	4.75	0.23	0.150	0.057	(0.135)	0.093
58	4.83	0.27	0.172	0.056	(0.154)	0.115
59	4.92	0.27	0.172	0.056	(0.154)	0.115
60	5.00	0.27	0.172	0.056	(0.154)	0.116
61	5.08	0.20	0.129	0.056	(0.116)	0.073
62	5.17	0.20	0.129	0.055	(0.116)	0.073
63	5.25	0.20	0.129	0.055	(0.116)	0.073
64	5.33	0.23	0.150	0.055	(0.135)	0.095
65	5.42	0.23	0.150	0.055	(0.135)	0.095
66	5.50	0.23	0.150	0.054	(0.135)	0.096
67	5.58	0.27	0.172	0.054	(0.154)	0.117
68	5.67	0.27	0.172	0.054	(0.154)	0.118
69	5.75	0.27	0.172	0.054	(0.154)	0.118
70	5.83	0.27	0.172	0.053	(0.154)	0.118
71	5.92	0.27	0.172	0.053	(0.154)	0.118
72	6.00	0.27	0.172	0.053	(0.154)	0.118
73	6.08	0.30	0.193	0.053	(0.174)	0.140
74	6.17	0.30	0.193	0.053	(0.174)	0.140
75	6.25	0.30	0.193	0.052	(0.174)	0.141
76	6.33	0.30	0.193	0.052	(0.174)	0.141
77	6.42	0.30	0.193	0.052	(0.174)	0.141
78	6.50	0.30	0.193	0.052	(0.174)	0.141
79	6.58	0.33	0.214	0.051	(0.193)	0.163
80	6.67	0.33	0.214	0.051	(0.193)	0.163
81	6.75	0.33	0.214	0.051	(0.193)	0.163
82	6.83	0.33	0.214	0.051	(0.193)	0.164
83	6.92	0.33	0.214	0.050	(0.193)	0.164
84	7.00	0.33	0.214	0.050	(0.193)	0.164
85	7.08	0.33	0.214	0.050	(0.193)	0.164
86	7.17	0.33	0.214	0.050	(0.193)	0.165
87	7.25	0.33	0.214	0.050	(0.193)	0.165
88	7.33	0.37	0.236	0.049	(0.212)	0.187
89	7.42	0.37	0.236	0.049	(0.212)	0.187
90	7.50	0.37	0.236	0.049	(0.212)	0.187
91	7.58	0.40	0.257	0.049	(0.232)	0.209
92	7.67	0.40	0.257	0.048	(0.232)	0.209
93	7.75	0.40	0.257	0.048	(0.232)	0.209
94	7.83	0.43	0.279	0.048	(0.251)	0.231
95	7.92	0.43	0.279	0.048	(0.251)	0.231
96	8.00	0.43	0.279	0.048	(0.251)	0.231
97	8.08	0.50	0.322	0.047	(0.289)	0.274
98	8.17	0.50	0.322	0.047	(0.289)	0.274
99	8.25	0.50	0.322	0.047	(0.289)	0.275
100	8.33	0.50	0.322	0.047	(0.289)	0.275
101	8.42	0.50	0.322	0.046	(0.289)	0.275
102	8.50	0.50	0.322	0.046	(0.289)	0.275
103	8.58	0.53	0.343	0.046	(0.309)	0.297
104	8.67	0.53	0.343	0.046	(0.309)	0.297
105	8.75	0.53	0.343	0.046	(0.309)	0.297
106	8.83	0.57	0.364	0.045	(0.328)	0.319
107	8.92	0.57	0.364	0.045	(0.328)	0.319
108	9.00	0.57	0.364	0.045	(0.328)	0.320
109	9.08	0.63	0.407	0.045	(0.367)	0.363
110	9.17	0.63	0.407	0.044	(0.367)	0.363
111	9.25	0.63	0.407	0.044	(0.367)	0.363
112	9.33	0.67	0.429	0.044	(0.386)	0.385
113	9.42	0.67	0.429	0.044	(0.386)	0.385
114	9.50	0.67	0.429	0.044	(0.386)	0.385
115	9.58	0.70	0.450	0.043	(0.405)	0.407
116	9.67	0.70	0.450	0.043	(0.405)	0.407
117	9.75	0.70	0.450	0.043	(0.405)	0.407
118	9.83	0.73	0.472	0.043	(0.424)	0.429
119	9.92	0.73	0.472	0.043	(0.424)	0.429
120	10.00	0.73	0.472	0.042	(0.424)	0.429
121	10.08	0.50	0.322	0.042	(0.289)	0.279

122	10.17	0.50	0.322	0.042	(0.289)	0.280
123	10.25	0.50	0.322	0.042	(0.289)	0.280
124	10.33	0.50	0.322	0.042	(0.289)	0.280
125	10.42	0.50	0.322	0.041	(0.289)	0.280
126	10.50	0.50	0.322	0.041	(0.289)	0.280
127	10.58	0.67	0.429	0.041	(0.386)	0.388
128	10.67	0.67	0.429	0.041	(0.386)	0.388
129	10.75	0.67	0.429	0.041	(0.386)	0.388
130	10.83	0.67	0.429	0.040	(0.386)	0.388
131	10.92	0.67	0.429	0.040	(0.386)	0.389
132	11.00	0.67	0.429	0.040	(0.386)	0.389
133	11.08	0.63	0.407	0.040	(0.367)	0.368
134	11.17	0.63	0.407	0.040	(0.367)	0.368
135	11.25	0.63	0.407	0.039	(0.367)	0.368
136	11.33	0.63	0.407	0.039	(0.367)	0.368
137	11.42	0.63	0.407	0.039	(0.367)	0.368
138	11.50	0.63	0.407	0.039	(0.367)	0.369
139	11.58	0.57	0.364	0.039	(0.328)	0.326
140	11.67	0.57	0.364	0.038	(0.328)	0.326
141	11.75	0.57	0.364	0.038	(0.328)	0.326
142	11.83	0.60	0.386	0.038	(0.347)	0.348
143	11.92	0.60	0.386	0.038	(0.347)	0.348
144	12.00	0.60	0.386	0.038	(0.347)	0.348
145	12.08	0.83	0.536	0.037	(0.482)	0.498
146	12.17	0.83	0.536	0.037	(0.482)	0.499
147	12.25	0.83	0.536	0.037	(0.482)	0.499
148	12.33	0.87	0.557	0.037	(0.502)	0.520
149	12.42	0.87	0.557	0.037	(0.502)	0.521
150	12.50	0.87	0.557	0.037	(0.502)	0.521
151	12.58	0.93	0.600	0.036	(0.540)	0.564
152	12.67	0.93	0.600	0.036	(0.540)	0.564
153	12.75	0.93	0.600	0.036	(0.540)	0.564
154	12.83	0.97	0.622	0.036	(0.560)	0.586
155	12.92	0.97	0.622	0.036	(0.560)	0.586
156	13.00	0.97	0.622	0.035	(0.560)	0.586
157	13.08	1.13	0.729	0.035	(0.656)	0.694
158	13.17	1.13	0.729	0.035	(0.656)	0.694
159	13.25	1.13	0.729	0.035	(0.656)	0.694
160	13.33	1.13	0.729	0.035	(0.656)	0.694
161	13.42	1.13	0.729	0.035	(0.656)	0.694
162	13.50	1.13	0.729	0.034	(0.656)	0.695
163	13.58	0.77	0.493	0.034	(0.444)	0.459
164	13.67	0.77	0.493	0.034	(0.444)	0.459
165	13.75	0.77	0.493	0.034	(0.444)	0.459
166	13.83	0.77	0.493	0.034	(0.444)	0.459
167	13.92	0.77	0.493	0.034	(0.444)	0.460
168	14.00	0.77	0.493	0.033	(0.444)	0.460
169	14.08	0.90	0.579	0.033	(0.521)	0.546
170	14.17	0.90	0.579	0.033	(0.521)	0.546
171	14.25	0.90	0.579	0.033	(0.521)	0.546
172	14.33	0.87	0.557	0.033	(0.502)	0.525
173	14.42	0.87	0.557	0.033	(0.502)	0.525
174	14.50	0.87	0.557	0.032	(0.502)	0.525
175	14.58	0.87	0.557	0.032	(0.502)	0.525
176	14.67	0.87	0.557	0.032	(0.502)	0.525
177	14.75	0.87	0.557	0.032	(0.502)	0.526
178	14.83	0.83	0.536	0.032	(0.482)	0.504
179	14.92	0.83	0.536	0.032	(0.482)	0.504
180	15.00	0.83	0.536	0.031	(0.482)	0.505
181	15.08	0.80	0.515	0.031	(0.463)	0.483
182	15.17	0.80	0.515	0.031	(0.463)	0.483
183	15.25	0.80	0.515	0.031	(0.463)	0.484
184	15.33	0.77	0.493	0.031	(0.444)	0.462
185	15.42	0.77	0.493	0.031	(0.444)	0.463
186	15.50	0.77	0.493	0.030	(0.444)	0.463
187	15.58	0.63	0.407	0.030	(0.367)	0.377
188	15.67	0.63	0.407	0.030	(0.367)	0.377
189	15.75	0.63	0.407	0.030	(0.367)	0.377
190	15.83	0.63	0.407	0.030	(0.367)	0.378
191	15.92	0.63	0.407	0.030	(0.367)	0.378
192	16.00	0.63	0.407	0.029	(0.367)	0.378
193	16.08	0.13	0.086	0.029	(0.077)	0.056
194	16.17	0.13	0.086	0.029	(0.077)	0.057
195	16.25	0.13	0.086	0.029	(0.077)	0.057
196	16.33	0.13	0.086	0.029	(0.077)	0.057
197	16.42	0.13	0.086	0.029	(0.077)	0.057
198	16.50	0.13	0.086	0.029	(0.077)	0.057
199	16.58	0.10	0.064	0.028	(0.058)	0.036
200	16.67	0.10	0.064	0.028	(0.058)	0.036
201	16.75	0.10	0.064	0.028	(0.058)	0.036
202	16.83	0.10	0.064	0.028	(0.058)	0.036
203	16.92	0.10	0.064	0.028	(0.058)	0.036
204	17.00	0.10	0.064	0.028	(0.058)	0.037
205	17.08	0.17	0.107	0.028	(0.096)	0.080
206	17.17	0.17	0.107	0.027	(0.096)	0.080
207	17.25	0.17	0.107	0.027	(0.096)	0.080
208	17.33	0.17	0.107	0.027	(0.096)	0.080
209	17.42	0.17	0.107	0.027	(0.096)	0.080
210	17.50	0.17	0.107	0.027	(0.096)	0.080
211	17.58	0.17	0.107	0.027	(0.096)	0.080
212	17.67	0.17	0.107	0.027	(0.096)	0.081
213	17.75	0.17	0.107	0.027	(0.096)	0.081
214	17.83	0.13	0.086	0.026	(0.077)	0.059
215	17.92	0.13	0.086	0.026	(0.077)	0.060
216	18.00	0.13	0.086	0.026	(0.077)	0.060
217	18.08	0.13	0.086	0.026	(0.077)	0.060
218	18.17	0.13	0.086	0.026	(0.077)	0.060
219	18.25	0.13	0.086	0.026	(0.077)	0.060
220	18.33	0.13	0.086	0.026	(0.077)	0.060
221	18.42	0.13	0.086	0.025	(0.077)	0.060
222	18.50	0.13	0.086	0.025	(0.077)	0.060
223	18.58	0.10	0.064	0.025	(0.058)	0.039
224	18.67	0.10	0.064	0.025	(0.058)	0.039
225	18.75	0.10	0.064	0.025	(0.058)	0.039
226	18.83	0.07	0.043	0.025	(0.039)	0.018
227	18.92	0.07	0.043	0.025	(0.039)	0.018
228	19.00	0.07	0.043	0.025	(0.039)	0.018
229	19.08	0.10	0.064	0.025	(0.058)	0.040
230	19.17	0.10	0.064	0.024	(0.058)	0.040
231	19.25	0.10	0.064	0.024	(0.058)	0.040
232	19.33	0.13	0.086	0.024	(0.077)	0.062
233	19.42	0.13	0.086	0.024	(0.077)	0.062
234	19.50	0.13	0.086	0.024	(0.077)	0.062
235	19.58	0.10	0.064	0.024	(0.058)	0.040
236	19.67	0.10	0.064	0.024	(0.058)	0.041
237	19.75	0.10	0.064	0.024	(0.058)	0.041
238	19.83	0.07	0.043	0.024	(0.039)	0.019
239	19.92	0.07	0.043	0.023	(0.039)	0.019
240	20.00	0.07	0.043	0.023	(0.039)	0.020
241	20.08	0.10	0.064	0.023	(0.058)	0.041

242	20.17	0.10	0.064	0.023	(	0.058)	0.041
243	20.25	0.10	0.064	0.023	(	0.058)	0.041
244	20.33	0.10	0.064	0.023	(	0.058)	0.041
245	20.42	0.10	0.064	0.023	(	0.058)	0.041
246	20.50	0.10	0.064	0.023	(	0.058)	0.042
247	20.58	0.10	0.064	0.023	(	0.058)	0.042
248	20.67	0.10	0.064	0.023	(	0.058)	0.042
249	20.75	0.10	0.064	0.022	(	0.058)	0.042
250	20.83	0.07	0.043	0.022	(	0.039)	0.021
251	20.92	0.07	0.043	0.022	(	0.039)	0.021
252	21.00	0.07	0.043	0.022	(	0.039)	0.021
253	21.08	0.10	0.064	0.022	(	0.058)	0.042
254	21.17	0.10	0.064	0.022	(	0.058)	0.042
255	21.25	0.10	0.064	0.022	(	0.058)	0.042
256	21.33	0.07	0.043	0.022	(	0.039)	0.021
257	21.42	0.07	0.043	0.022	(	0.039)	0.021
258	21.50	0.07	0.043	0.022	(	0.039)	0.021
259	21.58	0.10	0.064	0.022	(	0.058)	0.043
260	21.67	0.10	0.064	0.022	(	0.058)	0.043
261	21.75	0.10	0.064	0.021	(	0.058)	0.043
262	21.83	0.07	0.043	0.021	(	0.039)	0.022
263	21.92	0.07	0.043	0.021	(	0.039)	0.022
264	22.00	0.07	0.043	0.021	(	0.039)	0.022
265	22.08	0.10	0.064	0.021	(	0.058)	0.043
266	22.17	0.10	0.064	0.021	(	0.058)	0.043
267	22.25	0.10	0.064	0.021	(	0.058)	0.043
268	22.33	0.07	0.043	0.021	(	0.039)	0.022
269	22.42	0.07	0.043	0.021	(	0.039)	0.022
270	22.50	0.07	0.043	0.021	(	0.039)	0.022
271	22.58	0.07	0.043	0.021	(	0.039)	0.022
272	22.67	0.07	0.043	0.021	(	0.039)	0.022
273	22.75	0.07	0.043	0.021	(	0.039)	0.022
274	22.83	0.07	0.043	0.021	(	0.039)	0.022
275	22.92	0.07	0.043	0.021	(	0.039)	0.022
276	23.00	0.07	0.043	0.020	(	0.039)	0.022
277	23.08	0.07	0.043	0.020	(	0.039)	0.022
278	23.17	0.07	0.043	0.020	(	0.039)	0.022
279	23.25	0.07	0.043	0.020	(	0.039)	0.023
280	23.33	0.07	0.043	0.020	(	0.039)	0.023
281	23.42	0.07	0.043	0.020	(	0.039)	0.023
282	23.50	0.07	0.043	0.020	(	0.039)	0.023
283	23.58	0.07	0.043	0.020	(	0.039)	0.023
284	23.67	0.07	0.043	0.020	(	0.039)	0.023
285	23.75	0.07	0.043	0.020	(	0.039)	0.023
286	23.83	0.07	0.043	0.020	(	0.039)	0.023
287	23.92	0.07	0.043	0.020	(	0.039)	0.023
288	24.00	0.07	0.043	0.020	(	0.039)	0.023

(Loss Rate Not Used)

Sum = 100.0 Sum = 53.0

Flood volume = Effective rainfall 4.42(In)
times area 31.0(Ac.)/[(In)/(Ft.)] = 11.4(Ac.Ft)
Total soil loss = 0.94(In)
Total soil loss = 2.435(Ac.Ft)
Total rainfall = 5.36(In)
Flood volume = 496459.0 Cubic Feet
Total soil loss = 106081.6 Cubic Feet

Peak flow rate of this hydrograph = 21.117(CFS)

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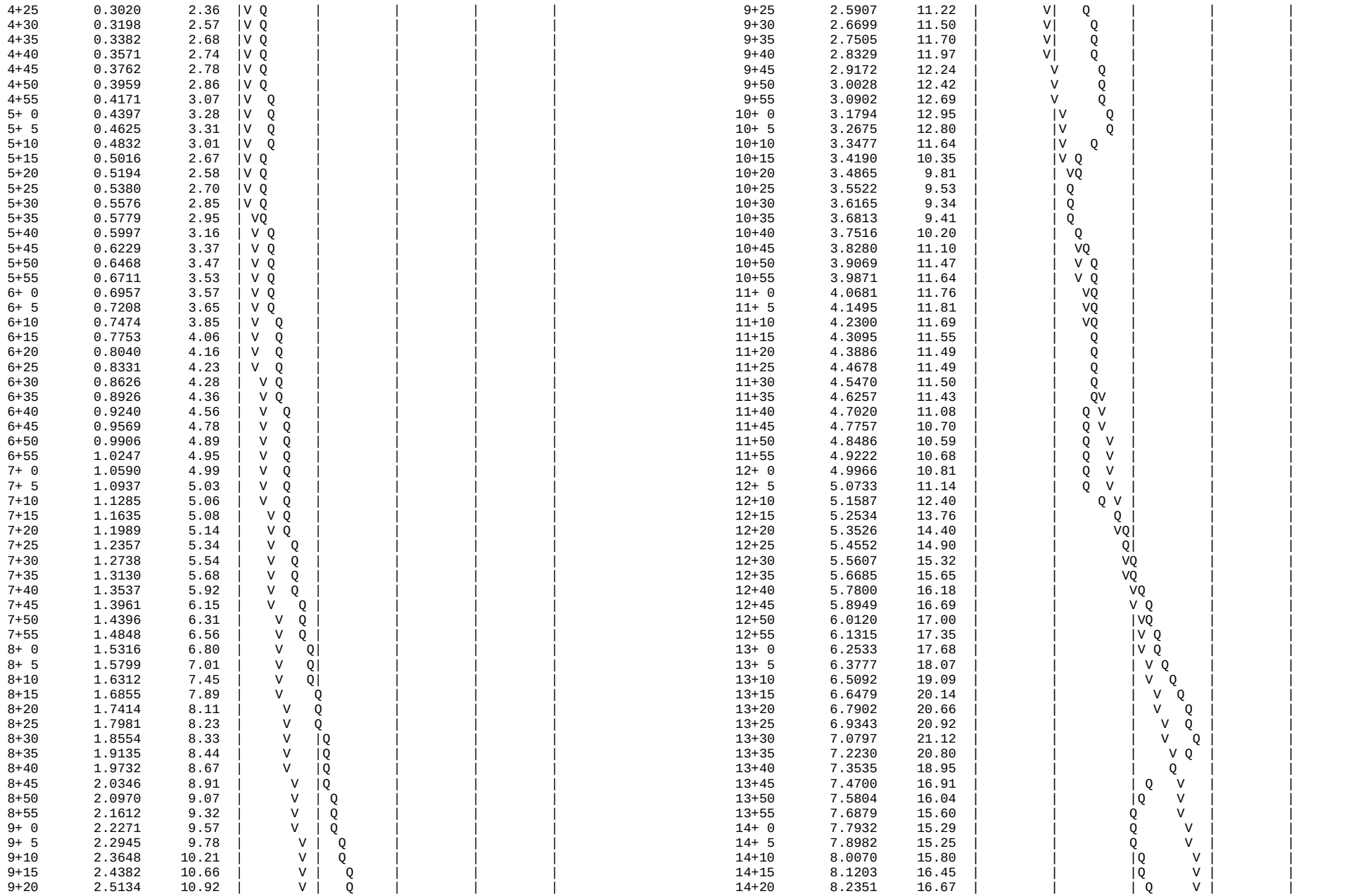
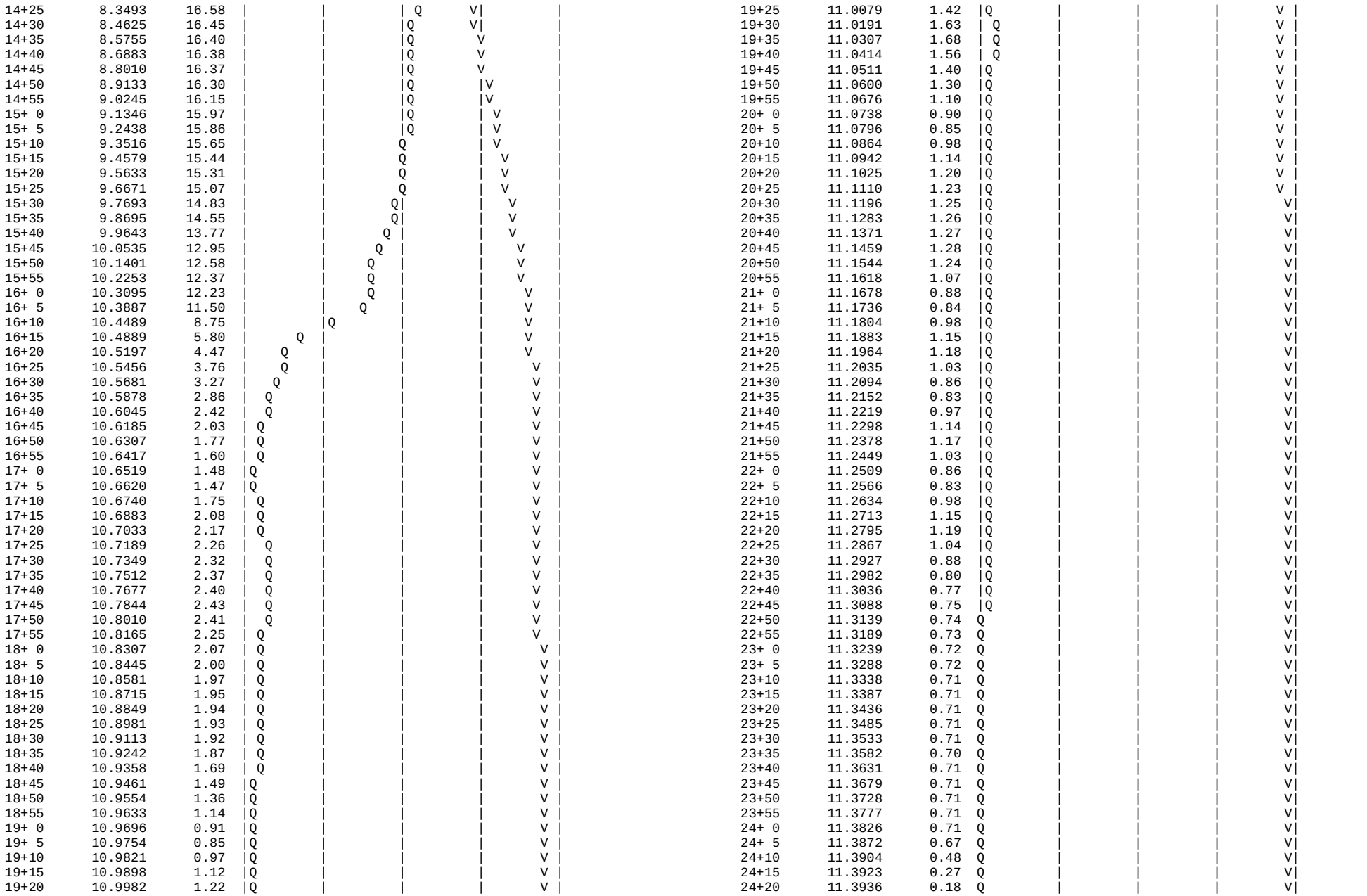
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0001	0.01	Q	|	|	|	|
0+10	0.0004	0.04	Q	|	|	|	|
0+15	0.0009	0.08	Q	|	|	|	|
0+20	0.0016	0.10	Q	|	|	|	|
0+25	0.0025	0.13	Q	|	|	|	|
0+30	0.0036	0.16	Q	|	|	|	|
0+35	0.0048	0.17	Q	|	|	|	|
0+40	0.0060	0.18	Q	|	|	|	|
0+45	0.0073	0.18	Q	|	|	|	|
0+50	0.0087	0.21	Q	|	|	|	|
0+55	0.0108	0.30	Q	|	|	|	|
1+ 0	0.0135	0.40	Q	|	|	|	|
1+ 5	0.0165	0.43	Q	|	|	|	|
1+10	0.0190	0.36	Q	|	|	|	|
1+15	0.0209	0.28	Q	|	|	|	|
1+20	0.0226	0.25	Q	|	|	|	|
1+25	0.0242	0.24	Q	|	|	|	|
1+30	0.0258	0.23	Q	|	|	|	|
1+35	0.0273	0.22	Q	|	|	|	|
1+40	0.0288	0.22	Q	|	|	|	|
1+45	0.0303	0.21	Q	|	|	|	|
1+50	0.0319	0.24	Q	|	|	|	|
1+55	0.0344	0.35	Q	|	|	|	|
2+ 0	0.0376	0.48	Q	|	|	|	|
2+ 5	0.0413	0.54	Q	|	|	|	|
2+10	0.0452	0.57	Q	|	|	|	|
2+15	0.0493	0.59	Q	|	|	|	|
2+20	0.0536	0.61	Q	|	|	|	|
2+25	0.0579	0.63	Q	|	|	|	|
2+30	0.0624	0.65	Q	|	|	|	|
2+35	0.0672	0.70	Q	|	|	|	|
2+40	0.0734	0.89	VQ	|	|	|	|
2+45	0.0809	1.10	VQ	|	|	|	|
2+50	0.0892	1.20	VQ	|	|	|	|
2+55	0.0978	1.25	VQ	|	|	|	|
3+ 0	0.1067	1.29	VQ	|	|	|	|
3+ 5	0.1158	1.33	VQ	|	|	|	|
3+10	0.1252	1.35	VQ	|	|	|	|
3+15	0.1346	1.37	VQ	|	|	|	|
3+20	0.1442	1.39	VQ	|	|	|	|
3+25	0.1539	1.41	VQ	|	|	|	|
3+30	0.1637	1.42	VQ	|	|	|	|
3+35	0.1736	1.44	VQ	|	|	|	|
3+40	0.1835	1.45	VQ	|	|	|	|
3+45	0.1936	1.46	VQ	|	|	|	|
3+50	0.2040	1.51	V Q	|	|	|	|
3+55	0.2157	1.70	V Q	|	|	|	|
4+ 0	0.2288	1.90	V Q	|	|	|	|
4+ 5	0.2425	1.99	V Q	|	|	|	|
4+10	0.2566	2.05	V Q	|	|	|	|
4+15	0.2709	2.08	V Q	|	|	|	|
4+20	0.2858	2.16	|VQ	|	|	|	|


4+25 0.3020 2.36 |V Q | | | |
4+30 0.3198 2.57 |V Q | | | |
4+35 0.3382 2.68 |V Q | | | |
4+40 0.3571 2.74 |V Q | | | |
4+45 0.3762 2.78 |V Q | | | |
4+50 0.3959 2.86 |V Q | | | |
4+55 0.4171 3.07 |V Q | | | |
5+ 0 0.4397 3.28 |V Q | | | |
5+ 5 0.4625 3.31 |V Q | | | |
5+10 0.4832 3.01 |V Q | | | |
5+15 0.5016 2.67 |V Q | | | |
5+20 0.5194 2.58 |V Q | | | |
5+25 0.5380 2.70 |V Q | | | |
5+30 0.5576 2.85 |V Q | | | |
5+35 0.5779 2.95 | VQ | | | |
5+40 0.5997 3.16 | V Q | | | |
5+45 0.6229 3.37 | V Q | | | |
5+50 0.6468 3.47 | V Q | | | |
5+55 0.6711 3.53 | V Q | | | |
6+ 0 0.6957 3.57 | V Q | | | |
6+ 5 0.7208 3.65 | V Q | | | |
6+10 0.7474 3.85 | V Q | | | |
6+15 0.7753 4.06 | V Q | | | |
6+20 0.8040 4.16 | V Q | | | |
6+25 0.8331 4.23 | V Q | | | |
6+30 0.8626 4.28 | V Q | | | |
6+35 0.8926 4.36 | V Q | | | |
6+40 0.9240 4.56 | V Q | | | |
6+45 0.9569 4.78 | V Q | | | |
6+50 0.9906 4.89 | V Q | | | |
6+55 1.0247 4.95 | V Q | | | |
7+ 0 1.0590 4.99 | V Q | | | |
7+ 5 1.0937 5.03 | V Q | | | |
7+10 1.1285 5.06 | V Q | | | |
7+15 1.1635 5.08 | V Q | | | |
7+20 1.1989 5.14 | V Q | | | |
7+25 1.2357 5.34 | V Q | | | |
7+30 1.2738 5.54 | V Q | | | |
7+35 1.3130 5.68 | V Q | | | |
7+40 1.3537 5.92 | V Q | | | |
7+45 1.3961 6.15 | V Q | | | |
7+50 1.4396 6.31 | V Q | | | |
7+55 1.4848 6.56 | V Q | | | |
8+ 0 1.5316 6.80 | V Q| | | |
8+ 5 1.5799 7.01 | V Q| | | |
8+10 1.6312 7.45 | V Q| | | |
8+15 1.6855 7.89 | V Q | | | |
8+20 1.7414 8.11 | V Q | | | |
8+25 1.7981 8.23 | V Q | | | |
8+30 1.8554 8.33 | V |Q | | |
8+35 1.9135 8.44 | V |Q | | |
8+40 1.9732 8.67 | V |Q | | |
8+45 2.0346 8.91 | V |Q | | |
8+50 2.0970 9.07 | V | Q | | |
8+55 2.1612 9.32 | V | Q | | |
9+ 0 2.2271 9.57 | V | Q | | |
9+ 5 2.2945 9.78 | V | Q | | |
9+10 2.3648 10.21 | V | Q | | |
9+15 2.4382 10.66 | V | Q | | |
9+20 2.5134 10.92 | V | Q | | |
9+25 2.5907 11.22 | V| Q | | |
9+30 2.6699 11.50 | V| Q | | |
9+35 2.7505 11.70 | V| Q | | |
9+40 2.8329 11.97 | V| Q | | |
9+45 2.9172 12.24 | V Q | | |
9+50 3.0028 12.42 | V Q | | |
9+55 3.0902 12.69 | V Q | | |
10+ 0 3.1794 12.95 | |V Q | | |
10+ 5 3.2675 12.80 | |V Q | | |
10+10 3.3477 11.64 | |V Q | | |
10+15 3.4190 10.35 | |V Q | | |
10+20 3.4865 9.81 | | VQ | | |
10+25 3.5522 9.53 | | Q | | |
10+30 3.6165 9.34 | | Q | | |
10+35 3.6813 9.41 | | Q | | |
10+40 3.7516 10.20 | | Q | | |
10+45 3.8280 11.10 | | VQ | | |
10+50 3.9069 11.47 | | V Q | | |
10+55 3.9871 11.64 | | V Q | | |
11+ 0 4.0681 11.76 | | VQ | | |
11+ 5 4.1495 11.81 | | VQ | | |
11+10 4.2300 11.69 | | VQ | | |
11+15 4.3095 11.55 | | Q | | |
11+20 4.3886 11.49 | | Q | | |
11+25 4.4678 11.49 | | Q | | |
11+30 4.5470 11.50 | | Q | | |
11+35 4.6257 11.43 | | QV | | |
11+40 4.7020 11.08 | | Q V | | |
11+45 4.7757 10.70 | | Q V | | |
11+50 4.8486 10.59 | | Q V | | |
11+55 4.9222 10.68 | | Q V | | |
12+ 0 4.9966 10.81 | | Q V | | |
12+ 5 5.0733 11.14 | | Q V | | |
12+10 5.1587 12.40 | | Q V | | |
12+15 5.2534 13.76 | | Q | | |
12+20 5.3526 14.40 | | VQ| | |
12+25 5.4552 14.90 | | Q| | |
12+30 5.5607 15.32 | | VQ | | |
12+35 5.6685 15.65 | | VQ | | |
12+40 5.7800 16.18 | | VQ | | |
12+45 5.8949 16.69 | | V Q | | |
12+50 6.0120 17.00 | | |VQ | | |
12+55 6.1315 17.35 | | |V Q | | |
13+ 0 6.2533 17.68 | | |V Q | | |
13+ 5 6.3777 18.07 | | | V Q | | |
13+10 6.5092 19.09 | | | V Q | | |
13+15 6.6479 20.14 | | | V Q | | |
13+20 6.7902 20.66 | | | V Q | | |
13+25 6.9343 20.92 | | | V Q | | |
13+30 7.0797 21.12 | | | V Q | | |
13+35 7.2230 20.80 | | | V Q | | |
13+40 7.3535 18.95 | | | Q | | |
13+45 7.4700 16.91 | | | Q V | | |
13+50 7.5804 16.04 | | | Q V | | |
13+55 7.6879 15.60 | | | Q V | | |
14+ 0 7.7932 15.29 | | | Q V | | |
14+ 5 7.8982 15.25 | | | Q V | | |
14+10 8.0070 15.80 | | | Q V | | |
14+15 8.1203 16.45 | | | Q V | | |
14+20 8.2351 16.67 | | | Q V | | |



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  24+25      11.3945      0.13  Q         |         |         |        V|
  24+30      11.3952      0.10  Q         |         |         |        V|
  24+35      11.3957      0.08  Q         |         |         |        V|
  24+40      11.3961      0.06  Q         |         |         |        V|
  24+45      11.3964      0.05  Q         |         |         |        V|
  24+50      11.3967      0.03  Q         |         |         |        V|
  24+55      11.3968      0.03  Q         |         |         |        V|
  25+ 0      11.3970      0.02  Q         |         |         |        V|
  25+ 5      11.3970      0.01  Q         |         |         |        V|
  25+10      11.3971      0.01  Q         |         |         |        V|
  25+15      11.3971      0.00  Q         |         |         |         V
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SECTION 5
PROPOSED CONDITION HYDROLOGY
UNIT METHOD ANALYSIS
AREA B

2-YEAR, 24HR STORM

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/09/23 File: vbuhpro242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Proposed Condition (Area B) 2 yr,24hr Storm
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1894.50(Ft.)
Length along longest watercourse measured to centroid = 666.90(Ft.)
Length along longest watercourse = 0.359 Mi.
Length along longest watercourse measured to centroid = 0.126 Mi.
Difference in elevation = 15.50(Ft.)
Slope along watercourse = 43.1987 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.054 Hr.
Lag time = 3.26 Min.
25% of lag time = 0.81 Min.
40% of lag time = 1.30 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	2.04	63.18

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	5.36	166.00

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.040(In)
Area Averaged 100-Year Rainfall = 5.360(In)

Point rain (area averaged) = 2.040(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 2.040(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.210	89.00	0.050
2.100	98.00	0.900
26.660	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
89.0	76.4	0.286	0.050	0.274	0.071	0.020
98.0	94.8	0.068	0.900	0.013	0.068	0.001
92.0	81.6	0.226	0.650	0.094	0.861	0.081
					Sum (F) =	0.101

Area averaged mean soil loss (F) (In/Hr) = 0.101
Minimum soil loss rate ((In/Hr)) = 0.051
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.400

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	153.415	33.991	10.609
2	0.167	306.829	46.758	14.594
3	0.250	460.244	10.986	3.429
4	0.333	613.658	4.781	1.492
5	0.417	767.073	2.370	0.740
6	0.500	920.487	1.114	0.348
		Sum = 100.000	Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.016	(0.179)	0.007	0.010
2	0.17	0.07	0.016	(0.178)	0.007	0.010
3	0.25	0.07	0.016	(0.178)	0.007	0.010
4	0.33	0.10	0.024	(0.177)	0.010	0.015
5	0.42	0.10	0.024	(0.176)	0.010	0.015
6	0.50	0.10	0.024	(0.176)	0.010	0.015
7	0.58	0.10	0.024	(0.175)	0.010	0.015
8	0.67	0.10	0.024	(0.174)	0.010	0.015
9	0.75	0.10	0.024	(0.174)	0.010	0.015

10	0.83	0.13	0.033	(0.173)	0.013	0.020
11	0.92	0.13	0.033	(0.172)	0.013	0.020
12	1.00	0.13	0.033	(0.172)	0.013	0.020
13	1.08	0.10	0.024	(0.171)	0.010	0.015
14	1.17	0.10	0.024	(0.170)	0.010	0.015
15	1.25	0.10	0.024	(0.170)	0.010	0.015
16	1.33	0.10	0.024	(0.169)	0.010	0.015
17	1.42	0.10	0.024	(0.168)	0.010	0.015
18	1.50	0.10	0.024	(0.168)	0.010	0.015
19	1.58	0.10	0.024	(0.167)	0.010	0.015
20	1.67	0.10	0.024	(0.166)	0.010	0.015
21	1.75	0.10	0.024	(0.166)	0.010	0.015
22	1.83	0.13	0.033	(0.165)	0.013	0.020
23	1.92	0.13	0.033	(0.164)	0.013	0.020
24	2.00	0.13	0.033	(0.164)	0.013	0.020
25	2.08	0.13	0.033	(0.163)	0.013	0.020
26	2.17	0.13	0.033	(0.162)	0.013	0.020
27	2.25	0.13	0.033	(0.162)	0.013	0.020
28	2.33	0.13	0.033	(0.161)	0.013	0.020
29	2.42	0.13	0.033	(0.160)	0.013	0.020
30	2.50	0.13	0.033	(0.160)	0.013	0.020
31	2.58	0.17	0.041	(0.159)	0.016	0.024
32	2.67	0.17	0.041	(0.158)	0.016	0.024
33	2.75	0.17	0.041	(0.158)	0.016	0.024
34	2.83	0.17	0.041	(0.157)	0.016	0.024
35	2.92	0.17	0.041	(0.156)	0.016	0.024
36	3.00	0.17	0.041	(0.156)	0.016	0.024
37	3.08	0.17	0.041	(0.155)	0.016	0.024
38	3.17	0.17	0.041	(0.154)	0.016	0.024
39	3.25	0.17	0.041	(0.154)	0.016	0.024
40	3.33	0.17	0.041	(0.153)	0.016	0.024
41	3.42	0.17	0.041	(0.152)	0.016	0.024
42	3.50	0.17	0.041	(0.152)	0.016	0.024
43	3.58	0.17	0.041	(0.151)	0.016	0.024
44	3.67	0.17	0.041	(0.151)	0.016	0.024
45	3.75	0.17	0.041	(0.150)	0.016	0.024
46	3.83	0.20	0.049	(0.149)	0.020	0.029
47	3.92	0.20	0.049	(0.149)	0.020	0.029
48	4.00	0.20	0.049	(0.148)	0.020	0.029
49	4.08	0.20	0.049	(0.147)	0.020	0.029
50	4.17	0.20	0.049	(0.147)	0.020	0.029
51	4.25	0.20	0.049	(0.146)	0.020	0.029
52	4.33	0.23	0.057	(0.146)	0.023	0.034
53	4.42	0.23	0.057	(0.145)	0.023	0.034
54	4.50	0.23	0.057	(0.144)	0.023	0.034
55	4.58	0.23	0.057	(0.144)	0.023	0.034
56	4.67	0.23	0.057	(0.143)	0.023	0.034
57	4.75	0.23	0.057	(0.142)	0.023	0.034
58	4.83	0.27	0.065	(0.142)	0.026	0.039
59	4.92	0.27	0.065	(0.141)	0.026	0.039
60	5.00	0.27	0.065	(0.141)	0.026	0.039
61	5.08	0.20	0.049	(0.140)	0.020	0.029
62	5.17	0.20	0.049	(0.139)	0.020	0.029
63	5.25	0.20	0.049	(0.139)	0.020	0.029
64	5.33	0.23	0.057	(0.138)	0.023	0.034
65	5.42	0.23	0.057	(0.138)	0.023	0.034
66	5.50	0.23	0.057	(0.137)	0.023	0.034
67	5.58	0.27	0.065	(0.136)	0.026	0.039
68	5.67	0.27	0.065	(0.136)	0.026	0.039
69	5.75	0.27	0.065	(0.135)	0.026	0.039
70	5.83	0.27	0.065	(0.135)	0.026	0.039
71	5.92	0.27	0.065	(0.134)	0.026	0.039
72	6.00	0.27	0.065	(0.133)	0.026	0.039
73	6.08	0.30	0.073	(0.133)	0.029	0.044
74	6.17	0.30	0.073	(0.132)	0.029	0.044
75	6.25	0.30	0.073	(0.132)	0.029	0.044
76	6.33	0.30	0.073	(0.131)	0.029	0.044
77	6.42	0.30	0.073	(0.130)	0.029	0.044
78	6.50	0.30	0.073	(0.130)	0.029	0.044
79	6.58	0.33	0.082	(0.129)	0.033	0.049
80	6.67	0.33	0.082	(0.129)	0.033	0.049
81	6.75	0.33	0.082	(0.128)	0.033	0.049
82	6.83	0.33	0.082	(0.128)	0.033	0.049
83	6.92	0.33	0.082	(0.127)	0.033	0.049
84	7.00	0.33	0.082	(0.126)	0.033	0.049
85	7.08	0.33	0.082	(0.126)	0.033	0.049
86	7.17	0.33	0.082	(0.125)	0.033	0.049
87	7.25	0.33	0.082	(0.125)	0.033	0.049
88	7.33	0.37	0.090	(0.124)	0.036	0.054
89	7.42	0.37	0.090	(0.124)	0.036	0.054
90	7.50	0.37	0.090	(0.123)	0.036	0.054
91	7.58	0.40	0.098	(0.122)	0.039	0.059
92	7.67	0.40	0.098	(0.122)	0.039	0.059
93	7.75	0.40	0.098	(0.121)	0.039	0.059
94	7.83	0.43	0.106	(0.121)	0.042	0.064
95	7.92	0.43	0.106	(0.120)	0.042	0.064
96	8.00	0.43	0.106	(0.120)	0.042	0.064
97	8.08	0.50	0.122	(0.119)	0.049	0.073
98	8.17	0.50	0.122	(0.118)	0.049	0.073
99	8.25	0.50	0.122	(0.118)	0.049	0.073
100	8.33	0.50	0.122	(0.117)	0.049	0.073
101	8.42	0.50	0.122	(0.117)	0.049	0.073
102	8.50	0.50	0.122	(0.116)	0.049	0.073
103	8.58	0.53	0.131	(0.116)	0.052	0.078
104	8.67	0.53	0.131	(0.115)	0.052	0.078
105	8.75	0.53	0.131	(0.115)	0.052	0.078
106	8.83	0.57	0.139	(0.114)	0.055	0.083
107	8.92	0.57	0.139	(0.114)	0.055	0.083
108	9.00	0.57	0.139	(0.113)	0.055	0.083
109	9.08	0.63	0.155	(0.112)	0.062	0.093
110	9.17	0.63	0.155	(0.112)	0.062	0.093
111	9.25	0.63	0.155	(0.111)	0.062	0.093
112	9.33	0.67	0.163	(0.111)	0.065	0.098
113	9.42	0.67	0.163	(0.110)	0.065	0.098
114	9.50	0.67	0.163	(0.110)	0.065	0.098
115	9.58	0.70	0.171	(0.109)	0.069	0.103
116	9.67	0.70	0.171	(0.109)	0.069	0.103
117	9.75	0.70	0.171	(0.108)	0.069	0.103
118	9.83	0.73	0.180	(0.108)	0.072	0.108
119	9.92	0.73	0.180	(0.107)	0.072	0.108
120	10.00	0.73	0.180	(0.107)	0.072	0.108
121	10.08	0.50	0.122	(0.106)	0.049	0.073
122	10.17	0.50	0.122	(0.106)	0.049	0.073
123	10.25	0.50	0.122	(0.105)	0.049	0.073
124	10.33	0.50	0.122	(0.105)	0.049	0.073
125	10.42	0.50	0.122	(0.104)	0.049	0.073
126	10.50	0.50	0.122	(0.104)	0.049	0.073
127	10.58	0.67	0.163	(0.103)	0.065	0.098
128	10.67	0.67	0.163	(0.103)	0.065	0.098
129	10.75	0.67	0.163	(0.102)	0.065	0.098

130	10.83	0.67	0.163	(0.102)	0.065	0.098
131	10.92	0.67	0.163	(0.101)	0.065	0.098
132	11.00	0.67	0.163	(0.101)	0.065	0.098
133	11.08	0.63	0.155	(0.100)	0.062	0.093
134	11.17	0.63	0.155	(0.100)	0.062	0.093
135	11.25	0.63	0.155	(0.099)	0.062	0.093
136	11.33	0.63	0.155	(0.099)	0.062	0.093
137	11.42	0.63	0.155	(0.098)	0.062	0.093
138	11.50	0.63	0.155	(0.098)	0.062	0.093
139	11.58	0.57	0.139	(0.097)	0.055	0.083
140	11.67	0.57	0.139	(0.097)	0.055	0.083
141	11.75	0.57	0.139	(0.096)	0.055	0.083
142	11.83	0.60	0.147	(0.096)	0.059	0.088
143	11.92	0.60	0.147	(0.095)	0.059	0.088
144	12.00	0.60	0.147	(0.095)	0.059	0.088
145	12.08	0.83	0.204	(0.094)	0.082	0.122
146	12.17	0.83	0.204	(0.094)	0.082	0.122
147	12.25	0.83	0.204	(0.093)	0.082	0.122
148	12.33	0.87	0.212	(0.093)	0.085	0.127
149	12.42	0.87	0.212	(0.092)	0.085	0.127
150	12.50	0.87	0.212	(0.092)	0.085	0.127
151	12.58	0.93	0.228	(0.092)	0.091	0.137
152	12.67	0.93	0.228	0.091	(0.091)	0.137
153	12.75	0.93	0.228	0.091	(0.091)	0.138
154	12.83	0.97	0.237	0.090	(0.095)	0.146
155	12.92	0.97	0.237	0.090	(0.095)	0.147
156	13.00	0.97	0.237	0.089	(0.095)	0.147
157	13.08	1.13	0.277	0.089	(0.111)	0.189
158	13.17	1.13	0.277	0.088	(0.111)	0.189
159	13.25	1.13	0.277	0.088	(0.111)	0.190
160	13.33	1.13	0.277	0.087	(0.111)	0.190
161	13.42	1.13	0.277	0.087	(0.111)	0.190
162	13.50	1.13	0.277	0.087	(0.111)	0.191
163	13.58	0.77	0.188	(0.086)	0.075	0.113
164	13.67	0.77	0.188	(0.086)	0.075	0.113
165	13.75	0.77	0.188	(0.085)	0.075	0.113
166	13.83	0.77	0.188	(0.085)	0.075	0.113
167	13.92	0.77	0.188	(0.084)	0.075	0.113
168	14.00	0.77	0.188	(0.084)	0.075	0.113
169	14.08	0.90	0.220	0.084	(0.088)	0.137
170	14.17	0.90	0.220	0.083	(0.088)	0.137
171	14.25	0.90	0.220	0.083	(0.088)	0.138
172	14.33	0.87	0.212	0.082	(0.085)	0.130
173	14.42	0.87	0.212	0.082	(0.085)	0.130
174	14.50	0.87	0.212	0.081	(0.085)	0.131
175	14.58	0.87	0.212	0.081	(0.085)	0.131
176	14.67	0.87	0.212	0.081	(0.085)	0.132
177	14.75	0.87	0.212	0.080	(0.085)	0.132
178	14.83	0.83	0.204	0.080	(0.082)	0.124
179	14.92	0.83	0.204	0.079	(0.082)	0.125
180	15.00	0.83	0.204	0.079	(0.082)	0.125
181	15.08	0.80	0.196	(0.079)	0.078	0.117
182	15.17	0.80	0.196	0.078	(0.078)	0.118
183	15.25	0.80	0.196	0.078	(0.078)	0.118
184	15.33	0.77	0.188	(0.077)	0.075	0.113
185	15.42	0.77	0.188	(0.077)	0.075	0.113
186	15.50	0.77	0.188	(0.077)	0.075	0.113
187	15.58	0.63	0.155	(0.076)	0.062	0.093
188	15.67	0.63	0.155	(0.076)	0.062	0.093
189	15.75	0.63	0.155	(0.075)	0.062	0.093
190	15.83	0.63	0.155	(0.075)	0.062	0.093
191	15.92	0.63	0.155	(0.075)	0.062	0.093
192	16.00	0.63	0.155	(0.074)	0.062	0.093
193	16.08	0.13	0.033	(0.074)	0.013	0.020
194	16.17	0.13	0.033	(0.073)	0.013	0.020
195	16.25	0.13	0.033	(0.073)	0.013	0.020
196	16.33	0.13	0.033	(0.073)	0.013	0.020
197	16.42	0.13	0.033	(0.072)	0.013	0.020
198	16.50	0.13	0.033	(0.072)	0.013	0.020
199	16.58	0.10	0.024	(0.072)	0.010	0.015
200	16.67	0.10	0.024	(0.071)	0.010	0.015
201	16.75	0.10	0.024	(0.071)	0.010	0.015
202	16.83	0.10	0.024	(0.071)	0.010	0.015
203	16.92	0.10	0.024	(0.070)	0.010	0.015
204	17.00	0.10	0.024	(0.070)	0.010	0.015
205	17.08	0.17	0.041	(0.069)	0.016	0.024
206	17.17	0.17	0.041	(0.069)	0.016	0.024
207	17.25	0.17	0.041	(0.069)	0.016	0.024
208	17.33	0.17	0.041	(0.068)	0.016	0.024
209	17.42	0.17	0.041	(0.068)	0.016	0.024
210	17.50	0.17	0.041	(0.068)	0.016	0.024
211	17.58	0.17	0.041	(0.067)	0.016	0.024
212	17.67	0.17	0.041	(0.067)	0.016	0.024
213	17.75	0.17	0.041	(0.067)	0.016	0.024
214	17.83	0.13	0.033	(0.066)	0.013	0.020
215	17.92	0.13	0.033	(0.066)	0.013	0.020
216	18.00	0.13	0.033	(0.066)	0.013	0.020
217	18.08	0.13	0.033	(0.065)	0.013	0.020
218	18.17	0.13	0.033	(0.065)	0.013	0.020
219	18.25	0.13	0.033	(0.065)	0.013	0.020
220	18.33	0.13	0.033	(0.064)	0.013	0.020
221	18.42	0.13	0.033	(0.064)	0.013	0.020
222	18.50	0.13	0.033	(0.064)	0.013	0.020
223	18.58	0.10	0.024	(0.064)	0.010	0.015
224	18.67	0.10	0.024	(0.063)	0.010	0.015
225	18.75	0.10	0.024	(0.063)	0.010	0.015
226	18.83	0.07	0.016	(0.063)	0.007	0.010
227	18.92	0.07	0.016	(0.062)	0.007	0.010
228	19.00	0.07	0.016	(0.062)	0.007	0.010
229	19.08	0.10	0.024	(0.062)	0.010	0.015
230	19.17	0.10	0.024	(0.061)	0.010	0.015
231	19.25	0.10	0.024	(0.061)	0.010	0.015
232	19.33	0.13	0.033	(0.061)	0.013	0.020
233	19.42	0.13	0.033	(0.061)	0.013	0.020
234	19.50	0.13	0.033	(0.060)	0.013	0.020
235	19.58	0.10	0.024	(0.060)	0.010	0.015
236	19.67	0.10	0.024	(0.060)	0.010	0.015
237	19.75	0.10	0.024	(0.059)	0.010	0.015
238	19.83	0.07	0.016	(0.059)	0.007	0.010
239	19.92	0.07	0.016	(0.059)	0.007	0.010
240	20.00	0.07	0.016	(0.059)	0.007	0.010
241	20.08	0.10	0.024	(0.058)	0.010	0.015
242	20.17	0.10	0.024	(0.058)	0.010	0.015
243	20.25	0.10	0.024	(0.058)	0.010	0.015
244	20.33	0.10	0.024	(0.058)	0.010	0.015
245	20.42	0.10	0.024	(0.057)	0.010	0.015
246	20.50	0.10	0.024	(0.057)	0.010	0.015
247	20.58	0.10	0.024	(0.057)	0.010	0.015
248	20.67	0.10	0.024	(0.057)	0.010	0.015
249	20.75	0.10	0.024	(0.056)	0.010	0.015

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250  20.83     0.07      0.016       (  0.056)       0.007        0.010
251  20.92     0.07      0.016       (  0.056)       0.007        0.010
252  21.00     0.07      0.016       (  0.056)       0.007        0.010
253  21.08     0.10      0.024       (  0.056)       0.010        0.015
254  21.17     0.10      0.024       (  0.055)       0.010        0.015
255  21.25     0.10      0.024       (  0.055)       0.010        0.015
256  21.33     0.07      0.016       (  0.055)       0.007        0.010
257  21.42     0.07      0.016       (  0.055)       0.007        0.010
258  21.50     0.07      0.016       (  0.054)       0.007        0.010
259  21.58     0.10      0.024       (  0.054)       0.010        0.015
260  21.67     0.10      0.024       (  0.054)       0.010        0.015
261  21.75     0.10      0.024       (  0.054)       0.010        0.015
262  21.83     0.07      0.016       (  0.054)       0.007        0.010
263  21.92     0.07      0.016       (  0.054)       0.007        0.010
264  22.00     0.07      0.016       (  0.053)       0.007        0.010
265  22.08     0.10      0.024       (  0.053)       0.010        0.015
266  22.17     0.10      0.024       (  0.053)       0.010        0.015
267  22.25     0.10      0.024       (  0.053)       0.010        0.015
268  22.33     0.07      0.016       (  0.053)       0.007        0.010
269  22.42     0.07      0.016       (  0.053)       0.007        0.010
270  22.50     0.07      0.016       (  0.052)       0.007        0.010
271  22.58     0.07      0.016       (  0.052)       0.007        0.010
272  22.67     0.07      0.016       (  0.052)       0.007        0.010
273  22.75     0.07      0.016       (  0.052)       0.007        0.010
274  22.83     0.07      0.016       (  0.052)       0.007        0.010
275  22.92     0.07      0.016       (  0.052)       0.007        0.010
276  23.00     0.07      0.016       (  0.052)       0.007        0.010
277  23.08     0.07      0.016       (  0.051)       0.007        0.010
278  23.17     0.07      0.016       (  0.051)       0.007        0.010
279  23.25     0.07      0.016       (  0.051)       0.007        0.010
280  23.33     0.07      0.016       (  0.051)       0.007        0.010
281  23.42     0.07      0.016       (  0.051)       0.007        0.010
282  23.50     0.07      0.016       (  0.051)       0.007        0.010
283  23.58     0.07      0.016       (  0.051)       0.007        0.010
284  23.67     0.07      0.016       (  0.051)       0.007        0.010
285  23.75     0.07      0.016       (  0.051)       0.007        0.010
286  23.83     0.07      0.016       (  0.051)       0.007        0.010
287  23.92     0.07      0.016       (  0.051)       0.007        0.010
288  24.00     0.07      0.016       (  0.051)       0.007        0.010
              (Loss Rate Not Used)
    Sum =     100.0                                  Sum =    14.9
       Flood volume = Effective rainfall      1.24(In)
        times area      31.0(Ac.)/[(In)/(Ft.)] =       3.2(Ac.Ft)
       Total soil loss =      0.80(In)
       Total soil loss =     2.063(Ac.Ft)
       Total rainfall =      2.04(In)
       Flood volume =      139475.1 Cubic Feet
       Total soil loss =       89850.0 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =      5.947(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                       R u n o f f      H y d r o g r a p h
       ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

       ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
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0+ 5       0.0007      0.10  Q          |          |          |          |
0+10       0.0024      0.25  Q          |          |          |          |
0+15       0.0043      0.28  VQ         |          |          |          |
0+20       0.0067      0.35  VQ         |          |          |          |
0+25       0.0097      0.43  VQ         |          |          |          |
0+30       0.0127      0.45  VQ         |          |          |          |
0+35       0.0159      0.45  VQ         |          |          |          |
0+40       0.0190      0.46  VQ         |          |          |          |
0+45       0.0222      0.46  VQ         |          |          |          |
0+50       0.0257      0.51  V Q        |          |          |          |
0+55       0.0297      0.58  V Q        |          |          |          |
1+ 0       0.0338      0.60  V Q        |          |          |          |
1+ 5       0.0376      0.55  V Q        |          |          |          |
1+10       0.0410      0.49  VQ         |          |          |          |
1+15       0.0442      0.47  VQ         |          |          |          |
1+20       0.0474      0.46  VQ         |          |          |          |
1+25       0.0506      0.46  VQ         |          |          |          |
1+30       0.0538      0.46  VQ         |          |          |          |
1+35       0.0569      0.46  VQ         |          |          |          |
1+40       0.0601      0.46  VQ         |          |          |          |
1+45       0.0632      0.46  VQ         |          |          |          |
1+50       0.0668      0.51  V Q        |          |          |          |
1+55       0.0708      0.58  V Q        |          |          |          |
2+ 0       0.0749      0.60  V Q        |          |          |          |
2+ 5       0.0791      0.61  V Q        |          |          |          |
2+10       0.0833      0.61  |VQ        |          |          |          |
2+15       0.0875      0.61  |VQ        |          |          |          |
2+20       0.0917      0.61  |VQ        |          |          |          |
2+25       0.0959      0.61  |VQ        |          |          |          |
2+30       0.1001      0.61  |VQ        |          |          |          |
2+35       0.1047      0.66  |VQ        |          |          |          |
2+40       0.1097      0.73  |VQ        |          |          |          |
2+45       0.1149      0.75  |V Q       |          |          |          |
2+50       0.1201      0.76  |V Q       |          |          |          |
2+55       0.1254      0.76  |V Q       |          |          |          |
3+ 0       0.1307      0.76  |V Q       |          |          |          |
3+ 5       0.1359      0.76  |V Q       |          |          |          |
3+10       0.1412      0.76  |V Q       |          |          |          |
3+15       0.1465      0.76  |V Q       |          |          |          |
3+20       0.1517      0.76  |V Q       |          |          |          |
3+25       0.1570      0.76  |V Q       |          |          |          |
3+30       0.1622      0.76  | VQ       |          |          |          |
3+35       0.1675      0.76  | VQ       |          |          |          |
3+40       0.1728      0.76  | VQ       |          |          |          |
3+45       0.1780      0.76  | VQ       |          |          |          |
3+50       0.1837      0.82  | VQ       |          |          |          |
3+55       0.1898      0.89  | VQ       |          |          |          |
4+ 0       0.1960      0.90  | VQ       |          |          |          |
4+ 5       0.2023      0.91  | VQ       |          |          |          |
4+10       0.2086      0.92  | VQ       |          |          |          |
4+15       0.2149      0.92  | VQ       |          |          |          |
4+20       0.2216      0.97  | VQ       |          |          |          |
4+25       0.2288      1.04  | V Q      |          |          |          |
4+30       0.2360      1.06  | V Q      |          |          |          |
4+35       0.2434      1.06  |  VQ      |          |          |          |
4+40       0.2507      1.07  |  VQ      |          |          |          |
4+45       0.2581      1.07  |  VQ      |          |          |          |
4+50       0.2658      1.12  |  VQ      |          |          |          |
4+55       0.2741      1.19  |  VQ      |          |          |          |
5+ 0       0.2824      1.21  |  VQ      |          |          |          |
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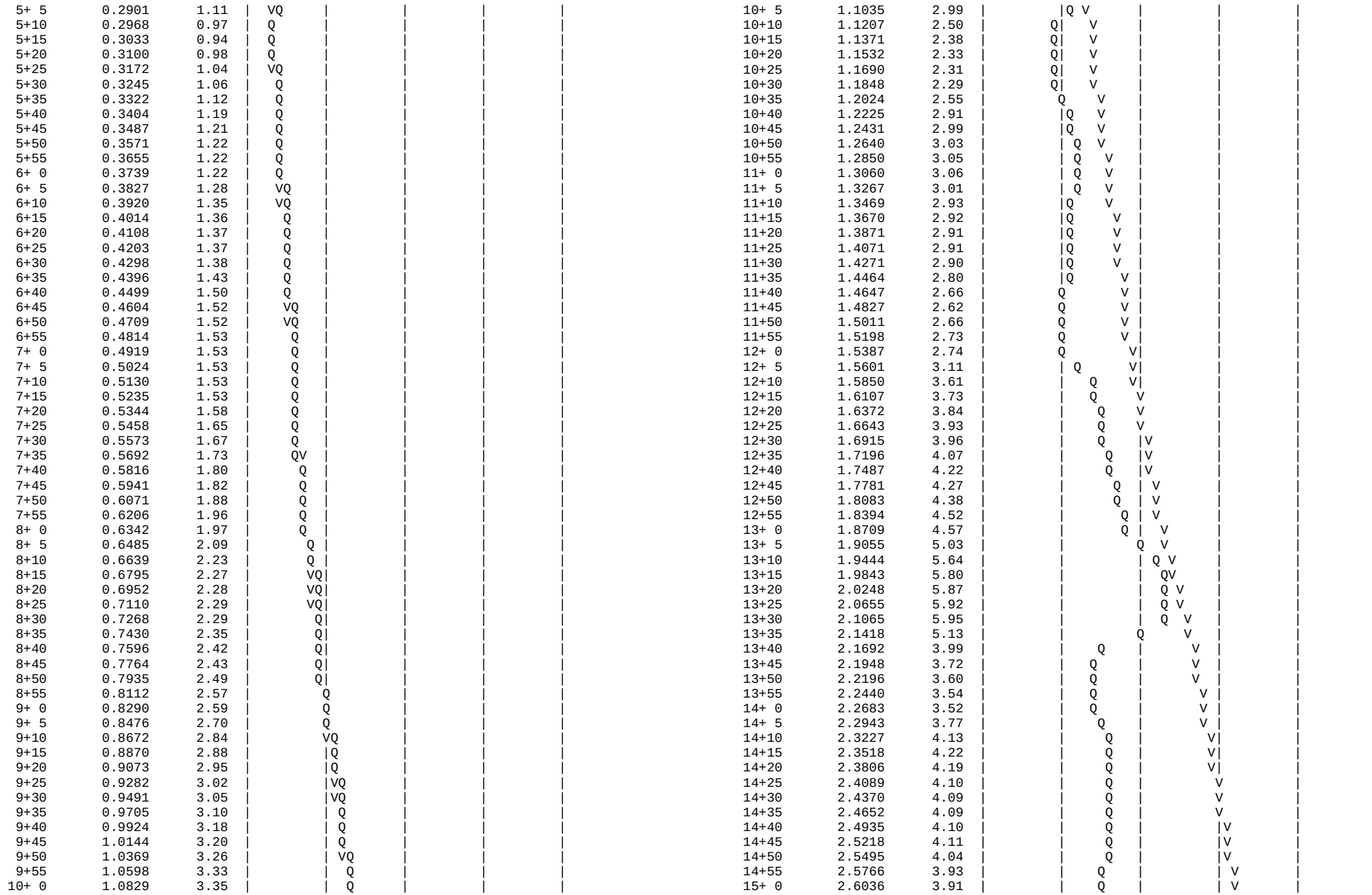

15+ 5	2.6299	3.83	|	Q |	V |	
15+10	2.6556	3.72	|	Q |	V |	
15+15	2.6810	3.70	|	Q |	V |	
15+20	2.7061	3.64	|	Q |	V |	
15+25	2.7305	3.55	|	Q |	V |	
15+30	2.7548	3.53	|	Q |	V |	
15+35	2.7776	3.31	|	Q |	V |	
15+40	2.7985	3.02	|	Q |	V |	
15+45	2.8188	2.96	|	Q |	V |	
15+50	2.8390	2.93	|	Q |	V |	
15+55	2.8590	2.91	|	Q |	V |	
16+ 0	2.8790	2.90	|	Q |	V |	
16+ 5	2.8937	2.13	|	Q |	V |	
16+10	2.9009	1.05	|	Q |	V |	
16+15	2.9064	0.80	|	Q |	V |	
16+20	2.9112	0.69	|	Q |	V |	
16+25	2.9156	0.64	|	Q |	V |	
16+30	2.9198	0.61	|	Q |	V |	
16+35	2.9237	0.56	|	Q |	V |	
16+40	2.9270	0.49	|	Q |	V |	
16+45	2.9303	0.47	|	Q |	V |	
16+50	2.9335	0.46	|	Q |	V |	
16+55	2.9366	0.46	|	Q |	V |	
17+ 0	2.9398	0.46	|	Q |	V |	
17+ 5	2.9437	0.56	|	Q |	V |	
17+10	2.9485	0.71	|	Q |	V |	
17+15	2.9536	0.74	|	Q |	V |	
17+20	2.9588	0.75	|	Q |	V |	
17+25	2.9640	0.76	|	Q |	V |	
17+30	2.9693	0.76	|	Q |	V |	
17+35	2.9746	0.76	|	Q |	V |	
17+40	2.9798	0.76	|	Q |	V |	
17+45	2.9851	0.76	|	Q |	V |	
17+50	2.9900	0.71	|	Q |	V |	
17+55	2.9944	0.64	|	Q |	V |	
18+ 0	2.9987	0.62	|	Q |	V |	
18+ 5	3.0030	0.62	|	Q |	V |	
18+10	3.0072	0.61	|	Q |	V |	
18+15	3.0114	0.61	|	Q |	V |	
18+20	3.0156	0.61	|	Q |	V |	
18+25	3.0198	0.61	|	Q |	V |	
18+30	3.0240	0.61	|	Q |	V |	
18+35	3.0279	0.56	|	Q |	V |	
18+40	3.0313	0.49	|	Q |	V |	
18+45	3.0345	0.47	|	Q |	V |	
18+50	3.0373	0.41	|	Q |	V |	
18+55	3.0397	0.34	|	Q |	V |	
19+ 0	3.0419	0.32	|	Q |	V |	
19+ 5	3.0444	0.36	|	Q |	V |	
19+10	3.0473	0.43	|	Q |	V |	
19+15	3.0504	0.45	|	Q |	V |	
19+20	3.0539	0.51	|	Q |	V |	
19+25	3.0579	0.58	|	Q |	V |	
19+30	3.0620	0.60	|	Q |	V |	
19+35	3.0658	0.55	|	Q |	V |	
19+40	3.0692	0.49	|	Q |	V |	
19+45	3.0724	0.47	|	Q |	V |	
19+50	3.0752	0.41	|	Q |	V |	
19+55	3.0776	0.34	|	Q |	V |	
20+ 0	3.0798	0.32	|	Q |	V |	

20+ 5	3.0823	0.36	|	Q |	V |	
20+10	3.0852	0.43	|	Q |	V |	
20+15	3.0883	0.45	|	Q |	V |	
20+20	3.0914	0.45	|	Q |	V |	
20+25	3.0946	0.46	|	Q |	V |	
20+30	3.0977	0.46	|	Q |	V |	
20+35	3.1009	0.46	|	Q |	V |	
20+40	3.1040	0.46	|	Q |	V |	
20+45	3.1072	0.46	|	Q |	V |	
20+50	3.1100	0.41	|	Q |	V |	
20+55	3.1123	0.34	|	Q |	V |	
21+ 0	3.1145	0.32	|	Q |	V |	
21+ 5	3.1170	0.36	|	Q |	V |	
21+10	3.1200	0.43	|	Q |	V |	
21+15	3.1230	0.45	|	Q |	V |	
21+20	3.1258	0.40	|	Q |	V |	
21+25	3.1281	0.33	|	Q |	V |	
21+30	3.1303	0.32	|	Q |	V |	
21+35	3.1328	0.36	|	Q |	V |	
21+40	3.1358	0.43	|	Q |	V |	
21+45	3.1388	0.45	|	Q |	V |	
21+50	3.1416	0.40	|	Q |	V |	
21+55	3.1439	0.33	|	Q |	V |	
22+ 0	3.1461	0.32	|	Q |	V |	
22+ 5	3.1486	0.36	|	Q |	V |	
22+10	3.1516	0.43	|	Q |	V |	
22+15	3.1546	0.45	|	Q |	V |	
22+20	3.1574	0.40	|	Q |	V |	
22+25	3.1597	0.33	|	Q |	V |	
22+30	3.1619	0.32	|	Q |	V |	
22+35	3.1640	0.31	|	Q |	V |	
22+40	3.1661	0.31	|	Q |	V |	
22+45	3.1683	0.31	|	Q |	V |	
22+50	3.1704	0.31	|	Q |	V |	
22+55	3.1725	0.31	|	Q |	V |	
23+ 0	3.1746	0.31	|	Q |	V |	
23+ 5	3.1767	0.31	|	Q |	V |	
23+10	3.1788	0.31	|	Q |	V |	
23+15	3.1809	0.31	|	Q |	V |	
23+20	3.1830	0.31	|	Q |	V |	
23+25	3.1851	0.31	|	Q |	V |	
23+30	3.1872	0.31	|	Q |	V |	
23+35	3.1893	0.31	|	Q |	V |	
23+40	3.1914	0.31	|	Q |	V |	
23+45	3.1935	0.31	|	Q |	V |	
23+50	3.1956	0.31	|	Q |	V |	
23+55	3.1977	0.31	|	Q |	V |	
24+ 0	3.1998	0.31	|	Q |	V |	
24+ 5	3.2012	0.20	|	Q |	V |	
24+10	3.2016	0.06	|	Q |	V |	
24+15	3.2018	0.03	|	Q |	V |	
24+20	3.2019	0.01	|	Q |	V |	
24+25	3.2019	0.00	|	Q |	V |	

10-YEAR, (1-HR, 3-HR, 6-HR, & 24HR) STORMS

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/09/23 File: vbuhpro110.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Proposed Condition (Area B) 10yr, 1hr Storm
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1894.50(Ft.)
Length along longest watercourse measured to centroid = 666.90(Ft.)
Length along longest watercourse = 0.359 Mi.
Length along longest watercourse measured to centroid = 0.126 Mi.
Difference in elevation = 15.50(Ft.)
Slope along watercourse = 43.1987 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.054 Hr.
Lag time = 3.26 Min.
25% of lag time = 0.81 Min.
40% of lag time = 1.30 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	0.49	15.05

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	1.65	51.10

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.486(In)
Area Averaged 100-Year Rainfall = 1.650(In)

Point rain (area averaged) = 0.965(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 0.965(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.210	89.00	0.050
2.100	98.00	0.900
26.660	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
89.0	89.0	0.141	0.050	0.135	0.071	0.010
98.0	98.0	0.026	0.900	0.005	0.068	0.000
92.0	92.0	0.104	0.650	0.043	0.861	0.037
					Sum (F) =	0.047

Area averaged mean soil loss (F) (In/Hr) = 0.047
Minimum soil loss rate ((In/Hr)) = 0.024
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.400

Slope of intensity-duration curve for a 1 hour storm =0.5000

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	153.415	33.991	10.609
2	0.167	306.829	46.758	14.594
3	0.250	460.244	10.986	3.429
4	0.333	613.658	4.781	1.492
5	0.417	767.073	2.370	0.740
6	0.500	920.487	1.114	0.348
		Sum = 100.000	Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.20	0.486	0.047	(0.194)	0.439
2	0.17	4.30	0.498	0.047	(0.199)	0.451
3	0.25	5.00	0.579	0.047	(0.232)	0.532
4	0.33	5.00	0.579	0.047	(0.232)	0.532
5	0.42	5.80	0.671	0.047	(0.269)	0.624
6	0.50	6.50	0.752	0.047	(0.301)	0.705
7	0.58	7.40	0.857	0.047	(0.343)	0.809

```
 8   0.67     8.60      0.995          0.047    (  0.398)        0.948
 9   0.75    12.30      1.424          0.047    (  0.570)        1.377
10   0.83    29.10      3.368          0.047    (  1.347)        3.321
11   0.92     6.80      0.787          0.047    (  0.315)        0.740
12   1.00     5.00      0.579          0.047    (  0.232)        0.532
               (Loss Rate Not Used)
   Sum =     100.0                                  Sum =    11.0
      Flood volume = Effective rainfall      0.92(In)
       times area      31.0(Ac.)/[(In)/(Ft.)] =       2.4(Ac.Ft)
      Total soil loss =      0.05(In)
      Total soil loss =     0.122(Ac.Ft)
      Total rainfall =      0.96(In)
      Flood volume =      103144.5 Cubic Feet
      Total soil loss =        5297.8 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     63.335(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          1 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                 Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       17.5      35.0      52.5      70.0
---------------------------------------------------------------------------
  0+ 5       0.0321      4.66  V Q       |         |         |         |
  0+10       0.1092     11.19  |V    Q   |         |         |         |
  0+15       0.2037     13.73  |  V   Q  |         |         |         |
  0+20       0.3112     15.61  |    V  Q |         |         |         |
  0+25       0.4298     17.21  |      V Q|         |         |         |
  0+30       0.5655     19.71  |        V|Q        |         |         |
  0+35       0.7196     22.38  |         | Q       |         |         |
  0+40       0.8974     25.82  |         |   QV    |         |         |
  0+45       1.1242     32.94  |         |       Q |         |         |
  0+50       1.5413     60.56  |         |         |     V   |   Q     |
  0+55       1.9775     63.33  |         |         |         |  V  Q   |
  1+ 0       2.1901     30.88  |         |      Q  |         |     V   |
  1+ 5       2.3045     16.61  |         |Q        |         |       V |
  1+10       2.3449      5.87  |  Q      |         |         |        V|
  1+15       2.3621      2.50  |Q        |         |         |        V|
  1+20       2.3666      0.65  Q         |         |         |        V|
  1+25       2.3679      0.18  Q         |         |         |        V|
---------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/09/23 File: vbuhpro310.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Proposed Condition (Area B) 10yr, 3hr Storm
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1894.50(Ft.)
Length along longest watercourse measured to centroid = 666.90(Ft.)
Length along longest watercourse = 0.359 Mi.
Length along longest watercourse measured to centroid = 0.126 Mi.
Difference in elevation = 15.50(Ft.)
Slope along watercourse = 43.1987 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.054 Hr.
Lag time = 3.26 Min.
25% of lag time = 0.81 Min.
40% of lag time = 1.30 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	0.83	25.86

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	2.23	69.06

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.835(In)
Area Averaged 100-Year Rainfall = 2.230(In)

Point rain (area averaged) = 1.409(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.409(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.210	89.00	0.050
2.100	98.00	0.900
26.660	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
89.0	89.0	0.141	0.050	0.135	0.071	0.010
98.0	98.0	0.026	0.900	0.005	0.068	0.000
92.0	92.0	0.104	0.650	0.043	0.861	0.037
					Sum (F) =	0.047

Area averaged mean soil loss (F) (In/Hr) = 0.047
Minimum soil loss rate ((In/Hr)) = 0.024
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.400

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	153.415	33.991	10.609
2	0.167	306.829	46.758	14.594
3	0.250	460.244	10.986	3.429
4	0.333	613.658	4.781	1.492
5	0.417	767.073	2.370	0.740
6	0.500	920.487	1.114	0.348
		Sum = 100.000	Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.220	0.047	(0.088)	0.173
2	0.17	1.30	0.220	0.047	(0.088)	0.173
3	0.25	1.10	0.186	0.047	(0.074)	0.139
4	0.33	1.50	0.254	0.047	(0.101)	0.206
5	0.42	1.50	0.254	0.047	(0.101)	0.206
6	0.50	1.80	0.304	0.047	(0.122)	0.257
7	0.58	1.50	0.254	0.047	(0.101)	0.206
8	0.67	1.80	0.304	0.047	(0.122)	0.257
9	0.75	1.80	0.304	0.047	(0.122)	0.257

10	0.83	1.50	0.254	0.047	(0.101)	0.206
11	0.92	1.60	0.270	0.047	(0.108)	0.223
12	1.00	1.80	0.304	0.047	(0.122)	0.257
13	1.08	2.20	0.372	0.047	(0.149)	0.325
14	1.17	2.20	0.372	0.047	(0.149)	0.325
15	1.25	2.20	0.372	0.047	(0.149)	0.325
16	1.33	2.00	0.338	0.047	(0.135)	0.291
17	1.42	2.60	0.440	0.047	(0.176)	0.392
18	1.50	2.70	0.456	0.047	(0.183)	0.409
19	1.58	2.40	0.406	0.047	(0.162)	0.359
20	1.67	2.70	0.456	0.047	(0.183)	0.409
21	1.75	3.30	0.558	0.047	(0.223)	0.511
22	1.83	3.10	0.524	0.047	(0.210)	0.477
23	1.92	2.90	0.490	0.047	(0.196)	0.443
24	2.00	3.00	0.507	0.047	(0.203)	0.460
25	2.08	3.10	0.524	0.047	(0.210)	0.477
26	2.17	4.20	0.710	0.047	(0.284)	0.663
27	2.25	5.00	0.845	0.047	(0.338)	0.798
28	2.33	3.50	0.592	0.047	(0.237)	0.545
29	2.42	6.80	1.150	0.047	(0.460)	1.102
30	2.50	7.30	1.234	0.047	(0.494)	1.187
31	2.58	8.20	1.386	0.047	(0.554)	1.339
32	2.67	5.90	0.997	0.047	(0.399)	0.950
33	2.75	2.00	0.338	0.047	(0.135)	0.291
34	2.83	1.80	0.304	0.047	(0.122)	0.257
35	2.92	1.80	0.304	0.047	(0.122)	0.257
36	3.00	0.60	0.101	(0.047)	0.041	0.061

(Loss Rate Not Used)

Sum = 100.0 Sum = 15.2

Flood volume = Effective rainfall 1.27(In)
times area 31.0(Ac.)/[(In)/(Ft.)] = 3.3(Ac.Ft)
Total soil loss = 0.14(In)
Total soil loss = 0.363(Ac.Ft)
Total rainfall = 1.41(In)
Flood volume = 142538.2 Cubic Feet
Total soil loss = 15832.0 Cubic Feet

Peak flow rate of this hydrograph = 36.961(CFS)

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3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0126	1.83	VQ	|	|	|	|
0+10	0.0426	4.35	V Q	|	|	|	|
0+15	0.0742	4.59	V Q	|	|	|	|
0+20	0.1091	5.07	|V Q	|	|	|	|
0+25	0.1509	6.07	|V Q	|	|	|	|
0+30	0.1980	6.85	| V Q	|	|	|	|
0+35	0.2471	7.13	| V Q	|	|	|	|
0+40	0.2963	7.14	| V Q	|	|	|	|
0+45	0.3500	7.80	| V Q	|	|	|	|
0+50	0.4009	7.40	| V Q	|	|	|	|
0+55	0.4484	6.89	| VQ	|	|	|	|
1+ 0	0.4990	7.35	| VQ	|	|	|	|
1+ 5	0.5579	8.56	| V Q	|	|	|	|
1+10	0.6244	9.65	| V Q	|	|	|	|
1+15	0.6927	9.93	| VQ	|	|	|	|
1+20	0.7595	9.70	| Q	|	|	|	|
1+25	0.8308	10.34	| Q	|	|	|	|
1+30	0.9128	11.91	| Q	|	|	|	|
1+35	0.9949	11.92	| QV	|	|	|	|
1+40	1.0768	11.90	| Q V	|	|	|	|
1+45	1.1707	13.63	| QV	|	|	|	|
1+50	1.2733	14.90	| QV	|	|	|	|
1+55	1.3727	14.44	| Q V	|	|	|	|
2+ 0	1.4704	14.18	| Q V	|	|	|	|
2+ 5	1.5705	14.53	| Q V	|	|	|	|
2+10	1.6860	16.77	| Q V	|	|	|	|
2+15	1.8304	20.97	| Q V	|	|	|	|
2+20	1.9744	20.91	| Q V	|	|	|	|
2+25	2.1390	23.89	| Q V	|	|	|	|
2+30	2.3622	32.41	| V | Q	|	|	|	|
2+35	2.6168	36.96	| V Q	|	|	|	|
2+40	2.8649	36.04	| VQ	|	|	|	|
2+45	3.0325	24.34	| Q	|	|	|	|
2+50	3.1255	13.50	| Q	|	|	|	|
2+55	3.1965	10.31	| Q	|	|	|	|
3+ 0	3.2439	6.89	| Q	|	|	|	|
3+ 5	3.2625	2.70	| Q	|	|	|	|
3+10	3.2686	0.88	Q	|	|	|	|
3+15	3.2712	0.37	Q	|	|	|	|
3+20	3.2721	0.13	Q	|	|	|	|
3+25	3.2722	0.02	Q	|	|	|	|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/09/23 File: vbuhpro610.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Proposed Condition (Area B) 10yr, 6hr Storm
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1894.50(Ft.)
Length along longest watercourse measured to centroid = 666.90(Ft.)
Length along longest watercourse = 0.359 Mi.
Length along longest watercourse measured to centroid = 0.126 Mi.
Difference in elevation = 15.50(Ft.)
Slope along watercourse = 43.1987 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.054 Hr.
Lag time = 3.26 Min.
25% of lag time = 0.81 Min.
40% of lag time = 1.30 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	1.16	35.93

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	2.89	89.50

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.160(In)
Area Averaged 100-Year Rainfall = 2.890(In)

Point rain (area averaged) = 1.872(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.872(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.210	89.00	0.050
2.100	98.00	0.900
26.660	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
89.0	89.0	0.141	0.050	0.135	0.071	0.010
98.0	98.0	0.026	0.900	0.005	0.068	0.000
92.0	92.0	0.104	0.650	0.043	0.861	0.037
					Sum (F) =	0.047

Area averaged mean soil loss (F) (In/Hr) = 0.047
Minimum soil loss rate ((In/Hr)) = 0.024
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.400

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	153.415	33.991	10.609
2	0.167	306.829	46.758	14.594
3	0.250	460.244	10.986	3.429
4	0.333	613.658	4.781	1.492
5	0.417	767.073	2.370	0.740
6	0.500	920.487	1.114	0.348
		Sum = 100.000	Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.112	(0.047)	0.045	0.067
2	0.17	0.60	0.135	0.047	(0.054)	0.088
3	0.25	0.60	0.135	0.047	(0.054)	0.088
4	0.33	0.60	0.135	0.047	(0.054)	0.088
5	0.42	0.60	0.135	0.047	(0.054)	0.088
6	0.50	0.70	0.157	0.047	(0.063)	0.110
7	0.58	0.70	0.157	0.047	(0.063)	0.110
8	0.67	0.70	0.157	0.047	(0.063)	0.110
9	0.75	0.70	0.157	0.047	(0.063)	0.110

10	0.83	0.70	0.157	0.047	(0.063)	0.110
11	0.92	0.70	0.157	0.047	(0.063)	0.110
12	1.00	0.80	0.180	0.047	(0.072)	0.133
13	1.08	0.80	0.180	0.047	(0.072)	0.133
14	1.17	0.80	0.180	0.047	(0.072)	0.133
15	1.25	0.80	0.180	0.047	(0.072)	0.133
16	1.33	0.80	0.180	0.047	(0.072)	0.133
17	1.42	0.80	0.180	0.047	(0.072)	0.133
18	1.50	0.80	0.180	0.047	(0.072)	0.133
19	1.58	0.80	0.180	0.047	(0.072)	0.133
20	1.67	0.80	0.180	0.047	(0.072)	0.133
21	1.75	0.80	0.180	0.047	(0.072)	0.133
22	1.83	0.80	0.180	0.047	(0.072)	0.133
23	1.92	0.80	0.180	0.047	(0.072)	0.133
24	2.00	0.90	0.202	0.047	(0.081)	0.155
25	2.08	0.80	0.180	0.047	(0.072)	0.133
26	2.17	0.90	0.202	0.047	(0.081)	0.155
27	2.25	0.90	0.202	0.047	(0.081)	0.155
28	2.33	0.90	0.202	0.047	(0.081)	0.155
29	2.42	0.90	0.202	0.047	(0.081)	0.155
30	2.50	0.90	0.202	0.047	(0.081)	0.155
31	2.58	0.90	0.202	0.047	(0.081)	0.155
32	2.67	0.90	0.202	0.047	(0.081)	0.155
33	2.75	1.00	0.225	0.047	(0.090)	0.177
34	2.83	1.00	0.225	0.047	(0.090)	0.177
35	2.92	1.00	0.225	0.047	(0.090)	0.177
36	3.00	1.00	0.225	0.047	(0.090)	0.177
37	3.08	1.00	0.225	0.047	(0.090)	0.177
38	3.17	1.10	0.247	0.047	(0.099)	0.200
39	3.25	1.10	0.247	0.047	(0.099)	0.200
40	3.33	1.10	0.247	0.047	(0.099)	0.200
41	3.42	1.20	0.270	0.047	(0.108)	0.222
42	3.50	1.30	0.292	0.047	(0.117)	0.245
43	3.58	1.40	0.314	0.047	(0.126)	0.267
44	3.67	1.40	0.314	0.047	(0.126)	0.267
45	3.75	1.50	0.337	0.047	(0.135)	0.290
46	3.83	1.50	0.337	0.047	(0.135)	0.290
47	3.92	1.60	0.359	0.047	(0.144)	0.312
48	4.00	1.60	0.359	0.047	(0.144)	0.312
49	4.08	1.70	0.382	0.047	(0.153)	0.335
50	4.17	1.80	0.404	0.047	(0.162)	0.357
51	4.25	1.90	0.427	0.047	(0.171)	0.380
52	4.33	2.00	0.449	0.047	(0.180)	0.402
53	4.42	2.10	0.472	0.047	(0.189)	0.425
54	4.50	2.10	0.472	0.047	(0.189)	0.425
55	4.58	2.20	0.494	0.047	(0.198)	0.447
56	4.67	2.30	0.517	0.047	(0.207)	0.469
57	4.75	2.40	0.539	0.047	(0.216)	0.492
58	4.83	2.40	0.539	0.047	(0.216)	0.492
59	4.92	2.50	0.561	0.047	(0.225)	0.514
60	5.00	2.60	0.584	0.047	(0.234)	0.537
61	5.08	3.10	0.696	0.047	(0.278)	0.649
62	5.17	3.60	0.809	0.047	(0.323)	0.761
63	5.25	3.90	0.876	0.047	(0.350)	0.829
64	5.33	4.20	0.943	0.047	(0.377)	0.896
65	5.42	4.70	1.056	0.047	(0.422)	1.008
66	5.50	5.60	1.258	0.047	(0.503)	1.211
67	5.58	1.90	0.427	0.047	(0.171)	0.380
68	5.67	0.90	0.202	0.047	(0.081)	0.155
69	5.75	0.60	0.135	0.047	(0.054)	0.088
70	5.83	0.50	0.112	0.047	(0.047)	0.045	0.067
71	5.92	0.30	0.067	0.047	(0.047)	0.027	0.040
72	6.00	0.20	0.045	0.047	(0.047)	0.018	0.027

(Loss Rate Not Used)

Sum = 100.0 Sum = 19.1

Flood volume = Effective rainfall 1.59(In)
times area 31.0(Ac.)/[(In)/(Ft.)] = 4.1(Ac.Ft)
Total soil loss = 0.28(In)
Total soil loss = 0.718(Ac.Ft)
Total rainfall = 1.87(In)
Flood volume = 179116.9 Cubic Feet
Total soil loss = 31283.3 Cubic Feet

Peak flow rate of this hydrograph = 32.675(CFS)

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6 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0049	0.72	Q				
0+10	0.0181	1.91	VQ				
0+15	0.0349	2.44	V Q				
0+20	0.0529	2.61	V Q				
0+25	0.0714	2.69	V Q				
0+30	0.0919	2.97	V Q				
0+35	0.1146	3.30	|V Q				
0+40	0.1379	3.38	|V Q				
0+45	0.1614	3.41	|V Q				
0+50	0.1850	3.43	|V Q				
0+55	0.2087	3.44	| VQ				
1+ 0	0.2340	3.68	| VQ				
1+ 5	0.2616	4.00	| V Q				
1+10	0.2897	4.08	| V Q				
1+15	0.3180	4.11	| VQ				
1+20	0.3465	4.13	| VQ				
1+25	0.3750	4.14	| VQ				
1+30	0.4035	4.14	| VQ				
1+35	0.4320	4.14	| Q				
1+40	0.4605	4.14	| Q				
1+45	0.4890	4.14	| Q				
1+50	0.5175	4.14	| QV				
1+55	0.5460	4.14	| QV				
2+ 0	0.5762	4.38	| QV				
2+ 5	0.6069	4.47	| QV				
2+10	0.6376	4.45	| Q V				
2+15	0.6703	4.74	| Q V				
2+20	0.7033	4.80	| Q V				
2+25	0.7365	4.82	| Q V				
2+30	0.7698	4.83	| Q V				
2+35	0.8031	4.84	| Q V				
2+40	0.8365	4.84	| Q V				
2+45	0.8715	5.08	| Q V				
2+50	0.9087	5.41	| Q V				
2+55	0.9465	5.48	| Q V|				
3+ 0	0.9845	5.52	| Q V|				

3+ 5	1.0226	5.53	| Q V|	|	|	|
3+10	1.0624	5.78	| Q V	|	|	|
3+15	1.1044	6.11	| Q V	|	|	|
3+20	1.1470	6.19	| Q |V	|	|	|
3+25	1.1915	6.46	| Q |V	|	|	|
3+30	1.2400	7.04	| Q | V	|	|	|
3+35	1.2930	7.69	| Q | V	|	|	|
3+40	1.3490	8.13	| Q | V	|	|	|
3+45	1.4075	8.50	| Q | V	|	|	|
3+50	1.4686	8.88	| Q | V	|	|	|
3+55	1.5321	9.22	| Q| V	|	|	|
4+ 0	1.5982	9.59	| Q| V	|	|	|
4+ 5	1.6665	9.92	| Q| V	|	|	|
4+10	1.7390	10.53	| Q V	|	|	|
4+15	1.8161	11.19	| |Q V	|	|	|
4+20	1.8979	11.87	| |Q V	|	|	|
4+25	1.9844	12.57	| | Q V|	|	|	|
4+30	2.0742	13.03	| | Q V	|	|	|
4+35	2.1665	13.40	| | Q |V	|	|	|
4+40	2.2631	14.03	| | Q | V	|	|	|
4+45	2.3643	14.70	| | Q | V	|	|	|
4+50	2.4686	15.14	| | Q | V	|	|	|
4+55	2.5754	15.51	| | Q | V	|	|	|
5+ 0	2.6866	16.13	| | Q | V	|	|	|
5+ 5	2.8088	17.75	| | Q | V	|	|	|
5+10	2.9514	20.70	| | Q V	|	|	|
5+15	3.1132	23.49	| | | Q V	|	|	|
5+20	3.2907	25.77	| | | Q | V	|	|	|
5+25	3.4866	28.44	| | | Q | V	|	|	|
5+30	3.7116	32.68	| | | | Q V	|	|	|
5+35	3.9002	27.38	| | | Q | V	|	|	|
5+40	3.9952	13.80	| | Q | | V	|	|	|
5+45	4.0459	7.36	| Q | | | V		|	|	|
5+50	4.0758	4.34	| Q | | | V		|	|	|
5+55	4.0940	2.65	| Q | | | V		|	|	|
6+ 0	4.1042	1.49	|Q | | | V		|	|	|
6+ 5	4.1094	0.75	Q | | | V		|	|	|
6+10	4.1110	0.23	Q | | | V		|	|	|
6+15	4.1117	0.09	Q | | | V		|	|	|
6+20	4.1119	0.03	Q | | | V		|	|	|
6+25	4.1120	0.01	Q | | | V	|	|	V

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/09/23 File: vbuhpro2410.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Proposed Condition (Area B) 10yr, 24hr Storm
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1894.50(Ft.)
Length along longest watercourse measured to centroid = 666.90(Ft.)
Length along longest watercourse = 0.359 Mi.
Length along longest watercourse measured to centroid = 0.126 Mi.
Difference in elevation = 15.50(Ft.)
Slope along watercourse = 43.1987 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.054 Hr.
Lag time = 3.26 Min.
25% of lag time = 0.81 Min.
40% of lag time = 1.30 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	2.04	63.18

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	5.36	166.00

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 2.040(In)
Area Averaged 100-Year Rainfall = 5.360(In)

Point rain (area averaged) = 3.406(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 3.406(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.210	89.00	0.050
2.100	98.00	0.900
26.660	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
89.0	89.0	0.141	0.050	0.135	0.071	0.010
98.0	98.0	0.026	0.900	0.005	0.068	0.000
92.0	92.0	0.104	0.650	0.043	0.861	0.037
					Sum (F) =	0.047

Area averaged mean soil loss (F) (In/Hr) = 0.047
Minimum soil loss rate ((In/Hr)) = 0.024
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.400

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	153.415	33.991	10.609
2	0.167	306.829	46.758	14.594
3	0.250	460.244	10.986	3.429
4	0.333	613.658	4.781	1.492
5	0.417	767.073	2.370	0.740
6	0.500	920.487	1.114	0.348
		Sum = 100.000	Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.027	(0.084)	0.011	0.016
2	0.17	0.07	0.027	(0.083)	0.011	0.016
3	0.25	0.07	0.027	(0.083)	0.011	0.016
4	0.33	0.10	0.041	(0.083)	0.016	0.025
5	0.42	0.10	0.041	(0.082)	0.016	0.025
6	0.50	0.10	0.041	(0.082)	0.016	0.025
7	0.58	0.10	0.041	(0.082)	0.016	0.025
8	0.67	0.10	0.041	(0.081)	0.016	0.025
9	0.75	0.10	0.041	(0.081)	0.016	0.025

10	0.83	0.13	0.054	(0.081)	0.022	0.033
11	0.92	0.13	0.054	(0.080)	0.022	0.033
12	1.00	0.13	0.054	(0.080)	0.022	0.033
13	1.08	0.10	0.041	(0.080)	0.016	0.025
14	1.17	0.10	0.041	(0.079)	0.016	0.025
15	1.25	0.10	0.041	(0.079)	0.016	0.025
16	1.33	0.10	0.041	(0.079)	0.016	0.025
17	1.42	0.10	0.041	(0.078)	0.016	0.025
18	1.50	0.10	0.041	(0.078)	0.016	0.025
19	1.58	0.10	0.041	(0.078)	0.016	0.025
20	1.67	0.10	0.041	(0.078)	0.016	0.025
21	1.75	0.10	0.041	(0.077)	0.016	0.025
22	1.83	0.13	0.054	(0.077)	0.022	0.033
23	1.92	0.13	0.054	(0.077)	0.022	0.033
24	2.00	0.13	0.054	(0.076)	0.022	0.033
25	2.08	0.13	0.054	(0.076)	0.022	0.033
26	2.17	0.13	0.054	(0.076)	0.022	0.033
27	2.25	0.13	0.054	(0.075)	0.022	0.033
28	2.33	0.13	0.054	(0.075)	0.022	0.033
29	2.42	0.13	0.054	(0.075)	0.022	0.033
30	2.50	0.13	0.054	(0.074)	0.022	0.033
31	2.58	0.17	0.068	(0.074)	0.027	0.041
32	2.67	0.17	0.068	(0.074)	0.027	0.041
33	2.75	0.17	0.068	(0.074)	0.027	0.041
34	2.83	0.17	0.068	(0.073)	0.027	0.041
35	2.92	0.17	0.068	(0.073)	0.027	0.041
36	3.00	0.17	0.068	(0.073)	0.027	0.041
37	3.08	0.17	0.068	(0.072)	0.027	0.041
38	3.17	0.17	0.068	(0.072)	0.027	0.041
39	3.25	0.17	0.068	(0.072)	0.027	0.041
40	3.33	0.17	0.068	(0.071)	0.027	0.041
41	3.42	0.17	0.068	(0.071)	0.027	0.041
42	3.50	0.17	0.068	(0.071)	0.027	0.041
43	3.58	0.17	0.068	(0.071)	0.027	0.041
44	3.67	0.17	0.068	(0.070)	0.027	0.041
45	3.75	0.17	0.068	(0.070)	0.027	0.041
46	3.83	0.20	0.082	(0.070)	0.033	0.049
47	3.92	0.20	0.082	(0.069)	0.033	0.049
48	4.00	0.20	0.082	(0.069)	0.033	0.049
49	4.08	0.20	0.082	(0.069)	0.033	0.049
50	4.17	0.20	0.082	(0.068)	0.033	0.049
51	4.25	0.20	0.082	(0.068)	0.033	0.049
52	4.33	0.23	0.095	(0.068)	0.038	0.057
53	4.42	0.23	0.095	(0.068)	0.038	0.057
54	4.50	0.23	0.095	(0.067)	0.038	0.057
55	4.58	0.23	0.095	(0.067)	0.038	0.057
56	4.67	0.23	0.095	(0.067)	0.038	0.057
57	4.75	0.23	0.095	(0.066)	0.038	0.057
58	4.83	0.27	0.109	(0.066)	0.044	0.065
59	4.92	0.27	0.109	(0.066)	0.044	0.065
60	5.00	0.27	0.109	(0.066)	0.044	0.065
61	5.08	0.20	0.082	(0.065)	0.033	0.049
62	5.17	0.20	0.082	(0.065)	0.033	0.049
63	5.25	0.20	0.082	(0.065)	0.033	0.049
64	5.33	0.23	0.095	(0.064)	0.038	0.057
65	5.42	0.23	0.095	(0.064)	0.038	0.057
66	5.50	0.23	0.095	(0.064)	0.038	0.057
67	5.58	0.27	0.109	(0.064)	0.044	0.065
68	5.67	0.27	0.109	(0.063)	0.044	0.065
69	5.75	0.27	0.109	(0.063)	0.044	0.065
70	5.83	0.27	0.109	(0.063)	0.044	0.065
71	5.92	0.27	0.109	(0.062)	0.044	0.065
72	6.00	0.27	0.109	(0.062)	0.044	0.065
73	6.08	0.30	0.123	(0.062)	0.049	0.074
74	6.17	0.30	0.123	(0.062)	0.049	0.074
75	6.25	0.30	0.123	(0.061)	0.049	0.074
76	6.33	0.30	0.123	(0.061)	0.049	0.074
77	6.42	0.30	0.123	(0.061)	0.049	0.074
78	6.50	0.30	0.123	(0.061)	0.049	0.074
79	6.58	0.33	0.136	(0.060)	0.054	0.082
80	6.67	0.33	0.136	(0.060)	0.054	0.082
81	6.75	0.33	0.136	(0.060)	0.054	0.082
82	6.83	0.33	0.136	(0.059)	0.054	0.082
83	6.92	0.33	0.136	(0.059)	0.054	0.082
84	7.00	0.33	0.136	(0.059)	0.054	0.082
85	7.08	0.33	0.136	(0.059)	0.054	0.082
86	7.17	0.33	0.136	(0.058)	0.054	0.082
87	7.25	0.33	0.136	(0.058)	0.054	0.082
88	7.33	0.37	0.150	0.058	(0.060)	0.092
89	7.42	0.37	0.150	0.058	(0.060)	0.092
90	7.50	0.37	0.150	0.057	(0.060)	0.093
91	7.58	0.40	0.163	0.057	(0.065)	0.106
92	7.67	0.40	0.163	0.057	(0.065)	0.107
93	7.75	0.40	0.163	0.057	(0.065)	0.107
94	7.83	0.43	0.177	0.056	(0.071)	0.121
95	7.92	0.43	0.177	0.056	(0.071)	0.121
96	8.00	0.43	0.177	0.056	(0.071)	0.121
97	8.08	0.50	0.204	0.056	(0.082)	0.149
98	8.17	0.50	0.204	0.055	(0.082)	0.149
99	8.25	0.50	0.204	0.055	(0.082)	0.149
100	8.33	0.50	0.204	0.055	(0.082)	0.150
101	8.42	0.50	0.204	0.054	(0.082)	0.150
102	8.50	0.50	0.204	0.054	(0.082)	0.150
103	8.58	0.53	0.218	0.054	(0.087)	0.164
104	8.67	0.53	0.218	0.054	(0.087)	0.164
105	8.75	0.53	0.218	0.053	(0.087)	0.164
106	8.83	0.57	0.232	0.053	(0.093)	0.178
107	8.92	0.57	0.232	0.053	(0.093)	0.179
108	9.00	0.57	0.232	0.053	(0.093)	0.179
109	9.08	0.63	0.259	0.052	(0.104)	0.206
110	9.17	0.63	0.259	0.052	(0.104)	0.207
111	9.25	0.63	0.259	0.052	(0.104)	0.207
112	9.33	0.67	0.272	0.052	(0.109)	0.221
113	9.42	0.67	0.272	0.051	(0.109)	0.221
114	9.50	0.67	0.272	0.051	(0.109)	0.221
115	9.58	0.70	0.286	0.051	(0.114)	0.235
116	9.67	0.70	0.286	0.051	(0.114)	0.235
117	9.75	0.70	0.286	0.050	(0.114)	0.236
118	9.83	0.73	0.300	0.050	(0.120)	0.249
119	9.92	0.73	0.300	0.050	(0.120)	0.250
120	10.00	0.73	0.300	0.050	(0.120)	0.250
121	10.08	0.50	0.204	0.050	(0.082)	0.155
122	10.17	0.50	0.204	0.049	(0.082)	0.155
123	10.25	0.50	0.204	0.049	(0.082)	0.155
124	10.33	0.50	0.204	0.049	(0.082)	0.156
125	10.42	0.50	0.204	0.049	(0.082)	0.156
126	10.50	0.50	0.204	0.048	(0.082)	0.156
127	10.58	0.67	0.272	0.048	(0.109)	0.224
128	10.67	0.67	0.272	0.048	(0.109)	0.225
129	10.75	0.67	0.272	0.048	(0.109)	0.225

130	10.83	0.67	0.272	0.047	(0.109)	0.225
131	10.92	0.67	0.272	0.047	(0.109)	0.225
132	11.00	0.67	0.272	0.047	(0.109)	0.226
133	11.08	0.63	0.259	0.047	(0.104)	0.212
134	11.17	0.63	0.259	0.046	(0.104)	0.212
135	11.25	0.63	0.259	0.046	(0.104)	0.213
136	11.33	0.63	0.259	0.046	(0.104)	0.213
137	11.42	0.63	0.259	0.046	(0.104)	0.213
138	11.50	0.63	0.259	0.046	(0.104)	0.213
139	11.58	0.57	0.232	0.045	(0.093)	0.186
140	11.67	0.57	0.232	0.045	(0.093)	0.186
141	11.75	0.57	0.232	0.045	(0.093)	0.187
142	11.83	0.60	0.245	0.045	(0.098)	0.201
143	11.92	0.60	0.245	0.044	(0.098)	0.201
144	12.00	0.60	0.245	0.044	(0.098)	0.201
145	12.08	0.83	0.341	0.044	(0.136)	0.297
146	12.17	0.83	0.341	0.044	(0.136)	0.297
147	12.25	0.83	0.341	0.044	(0.136)	0.297
148	12.33	0.87	0.354	0.043	(0.142)	0.311
149	12.42	0.87	0.354	0.043	(0.142)	0.311
150	12.50	0.87	0.354	0.043	(0.142)	0.311
151	12.58	0.93	0.381	0.043	(0.153)	0.339
152	12.67	0.93	0.381	0.042	(0.153)	0.339
153	12.75	0.93	0.381	0.042	(0.153)	0.339
154	12.83	0.97	0.395	0.042	(0.158)	0.353
155	12.92	0.97	0.395	0.042	(0.158)	0.353
156	13.00	0.97	0.395	0.042	(0.158)	0.353
157	13.08	1.13	0.463	0.041	(0.185)	0.422
158	13.17	1.13	0.463	0.041	(0.185)	0.422
159	13.25	1.13	0.463	0.041	(0.185)	0.422
160	13.33	1.13	0.463	0.041	(0.185)	0.422
161	13.42	1.13	0.463	0.041	(0.185)	0.423
162	13.50	1.13	0.463	0.040	(0.185)	0.423
163	13.58	0.77	0.313	0.040	(0.125)	0.273
164	13.67	0.77	0.313	0.040	(0.125)	0.273
165	13.75	0.77	0.313	0.040	(0.125)	0.274
166	13.83	0.77	0.313	0.040	(0.125)	0.274
167	13.92	0.77	0.313	0.039	(0.125)	0.274
168	14.00	0.77	0.313	0.039	(0.125)	0.274
169	14.08	0.90	0.368	0.039	(0.147)	0.329
170	14.17	0.90	0.368	0.039	(0.147)	0.329
171	14.25	0.90	0.368	0.039	(0.147)	0.329
172	14.33	0.87	0.354	0.038	(0.142)	0.316
173	14.42	0.87	0.354	0.038	(0.142)	0.316
174	14.50	0.87	0.354	0.038	(0.142)	0.316
175	14.58	0.87	0.354	0.038	(0.142)	0.316
176	14.67	0.87	0.354	0.038	(0.142)	0.317
177	14.75	0.87	0.354	0.037	(0.142)	0.317
178	14.83	0.83	0.341	0.037	(0.136)	0.303
179	14.92	0.83	0.341	0.037	(0.136)	0.304
180	15.00	0.83	0.341	0.037	(0.136)	0.304
181	15.08	0.80	0.327	0.037	(0.131)	0.290
182	15.17	0.80	0.327	0.036	(0.131)	0.291
183	15.25	0.80	0.327	0.036	(0.131)	0.291
184	15.33	0.77	0.313	0.036	(0.125)	0.277
185	15.42	0.77	0.313	0.036	(0.125)	0.277
186	15.50	0.77	0.313	0.036	(0.125)	0.278
187	15.58	0.63	0.259	0.036	(0.104)	0.223
188	15.67	0.63	0.259	0.035	(0.104)	0.224
189	15.75	0.63	0.259	0.035	(0.104)	0.224
190	15.83	0.63	0.259	0.035	(0.104)	0.224
191	15.92	0.63	0.259	0.035	(0.104)	0.224
192	16.00	0.63	0.259	0.035	(0.104)	0.224
193	16.08	0.13	0.054	(0.034)	0.022	0.033
194	16.17	0.13	0.054	(0.034)	0.022	0.033
195	16.25	0.13	0.054	(0.034)	0.022	0.033
196	16.33	0.13	0.054	(0.034)	0.022	0.033
197	16.42	0.13	0.054	(0.034)	0.022	0.033
198	16.50	0.13	0.054	(0.034)	0.022	0.033
199	16.58	0.10	0.041	(0.033)	0.016	0.025
200	16.67	0.10	0.041	(0.033)	0.016	0.025
201	16.75	0.10	0.041	(0.033)	0.016	0.025
202	16.83	0.10	0.041	(0.033)	0.016	0.025
203	16.92	0.10	0.041	(0.033)	0.016	0.025
204	17.00	0.10	0.041	(0.033)	0.016	0.025
205	17.08	0.17	0.068	(0.032)	0.027	0.041
206	17.17	0.17	0.068	(0.032)	0.027	0.041
207	17.25	0.17	0.068	(0.032)	0.027	0.041
208	17.33	0.17	0.068	(0.032)	0.027	0.041
209	17.42	0.17	0.068	(0.032)	0.027	0.041
210	17.50	0.17	0.068	(0.032)	0.027	0.041
211	17.58	0.17	0.068	(0.031)	0.027	0.041
212	17.67	0.17	0.068	(0.031)	0.027	0.041
213	17.75	0.17	0.068	(0.031)	0.027	0.041
214	17.83	0.13	0.054	(0.031)	0.022	0.033
215	17.92	0.13	0.054	(0.031)	0.022	0.033
216	18.00	0.13	0.054	(0.031)	0.022	0.033
217	18.08	0.13	0.054	(0.031)	0.022	0.033
218	18.17	0.13	0.054	(0.030)	0.022	0.033
219	18.25	0.13	0.054	(0.030)	0.022	0.033
220	18.33	0.13	0.054	(0.030)	0.022	0.033
221	18.42	0.13	0.054	(0.030)	0.022	0.033
222	18.50	0.13	0.054	(0.030)	0.022	0.033
223	18.58	0.10	0.041	(0.030)	0.016	0.025
224	18.67	0.10	0.041	(0.029)	0.016	0.025
225	18.75	0.10	0.041	(0.029)	0.016	0.025
226	18.83	0.07	0.027	(0.029)	0.011	0.016
227	18.92	0.07	0.027	(0.029)	0.011	0.016
228	19.00	0.07	0.027	(0.029)	0.011	0.016
229	19.08	0.10	0.041	(0.029)	0.016	0.025
230	19.17	0.10	0.041	(0.029)	0.016	0.025
231	19.25	0.10	0.041	(0.029)	0.016	0.025
232	19.33	0.13	0.054	(0.028)	0.022	0.033
233	19.42	0.13	0.054	(0.028)	0.022	0.033
234	19.50	0.13	0.054	(0.028)	0.022	0.033
235	19.58	0.10	0.041	(0.028)	0.016	0.025
236	19.67	0.10	0.041	(0.028)	0.016	0.025
237	19.75	0.10	0.041	(0.028)	0.016	0.025
238	19.83	0.07	0.027	(0.028)	0.011	0.016
239	19.92	0.07	0.027	(0.027)	0.011	0.016
240	20.00	0.07	0.027	(0.027)	0.011	0.016
241	20.08	0.10	0.041	(0.027)	0.016	0.025
242	20.17	0.10	0.041	(0.027)	0.016	0.025
243	20.25	0.10	0.041	(0.027)	0.016	0.025
244	20.33	0.10	0.041	(0.027)	0.016	0.025
245	20.42	0.10	0.041	(0.027)	0.016	0.025
246	20.50	0.10	0.041	(0.027)	0.016	0.025
247	20.58	0.10	0.041	(0.027)	0.016	0.025
248	20.67	0.10	0.041	(0.026)	0.016	0.025
249	20.75	0.10	0.041	(0.026)	0.016	0.025

250	20.83	0.07	0.027	(0.026)	0.011	0.016
251	20.92	0.07	0.027	(0.026)	0.011	0.016
252	21.00	0.07	0.027	(0.026)	0.011	0.016
253	21.08	0.10	0.041	(0.026)	0.016	0.025
254	21.17	0.10	0.041	(0.026)	0.016	0.025
255	21.25	0.10	0.041	(0.026)	0.016	0.025
256	21.33	0.07	0.027	(0.026)	0.011	0.016
257	21.42	0.07	0.027	(0.026)	0.011	0.016
258	21.50	0.07	0.027	(0.025)	0.011	0.016
259	21.58	0.10	0.041	(0.025)	0.016	0.025
260	21.67	0.10	0.041	(0.025)	0.016	0.025
261	21.75	0.10	0.041	(0.025)	0.016	0.025
262	21.83	0.07	0.027	(0.025)	0.011	0.016
263	21.92	0.07	0.027	(0.025)	0.011	0.016
264	22.00	0.07	0.027	(0.025)	0.011	0.016
265	22.08	0.10	0.041	(0.025)	0.016	0.025
266	22.17	0.10	0.041	(0.025)	0.016	0.025
267	22.25	0.10	0.041	(0.025)	0.016	0.025
268	22.33	0.07	0.027	(0.025)	0.011	0.016
269	22.42	0.07	0.027	(0.024)	0.011	0.016
270	22.50	0.07	0.027	(0.024)	0.011	0.016
271	22.58	0.07	0.027	(0.024)	0.011	0.016
272	22.67	0.07	0.027	(0.024)	0.011	0.016
273	22.75	0.07	0.027	(0.024)	0.011	0.016
274	22.83	0.07	0.027	(0.024)	0.011	0.016
275	22.92	0.07	0.027	(0.024)	0.011	0.016
276	23.00	0.07	0.027	(0.024)	0.011	0.016
277	23.08	0.07	0.027	(0.024)	0.011	0.016
278	23.17	0.07	0.027	(0.024)	0.011	0.016
279	23.25	0.07	0.027	(0.024)	0.011	0.016
280	23.33	0.07	0.027	(0.024)	0.011	0.016
281	23.42	0.07	0.027	(0.024)	0.011	0.016
282	23.50	0.07	0.027	(0.024)	0.011	0.016
283	23.58	0.07	0.027	(0.024)	0.011	0.016
284	23.67	0.07	0.027	(0.024)	0.011	0.016
285	23.75	0.07	0.027	(0.024)	0.011	0.016
286	23.83	0.07	0.027	(0.024)	0.011	0.016
287	23.92	0.07	0.027	(0.024)	0.011	0.016
288	24.00	0.07	0.027	(0.024)	0.011	0.016

(Loss Rate Not Used)

Sum = 100.0 Sum = 31.8

Flood volume = Effective rainfall 2.65(In)
times area 31.0(Ac.)/[(In)/(Ft.)] = 6.8(Ac.Ft)
Total soil loss = 0.76(In)
Total soil loss = 1.959(Ac.Ft)
Total rainfall = 3.41(In)
Flood volume = 297539.4 Cubic Feet
Total soil loss = 85329.6 Cubic Feet

Peak flow rate of this hydrograph = 13.197(CFS)

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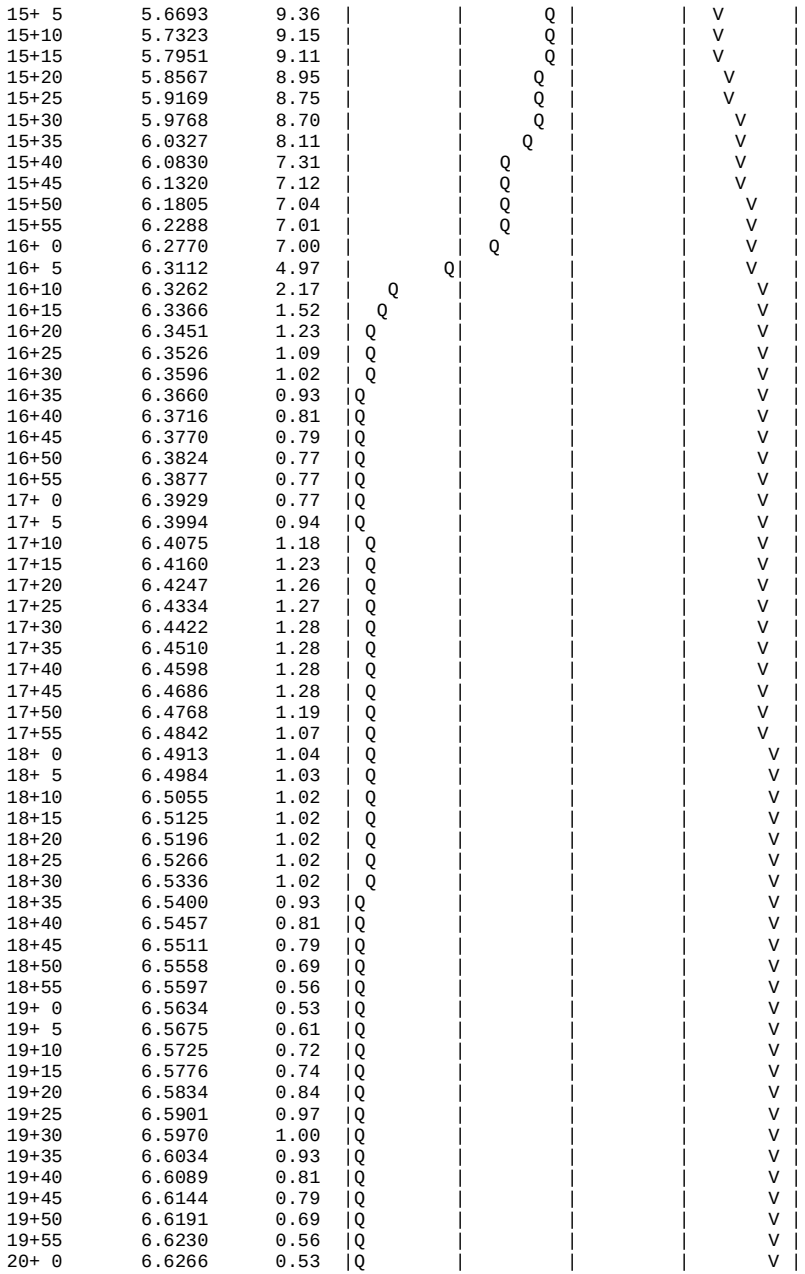
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0012	0.17	Q				
0+10	0.0040	0.41	Q				
0+15	0.0073	0.47	Q				
0+20	0.0113	0.58	VQ				
0+25	0.0161	0.71	VQ				
0+30	0.0213	0.74	VQ				
0+35	0.0265	0.76	VQ				
0+40	0.0317	0.76	VQ				
0+45	0.0370	0.77	VQ				
0+50	0.0429	0.85	VQ				
0+55	0.0496	0.97	VQ				
1+ 0	0.0565	1.00	VQ				
1+ 5	0.0628	0.93	VQ				
1+10	0.0684	0.81	VQ				
1+15	0.0738	0.79	VQ				
1+20	0.0792	0.77	VQ				
1+25	0.0845	0.77	VQ				
1+30	0.0898	0.77	VQ				
1+35	0.0950	0.77	VQ				
1+40	0.1003	0.77	VQ				
1+45	0.1056	0.77	VQ				
1+50	0.1114	0.85	VQ				
1+55	0.1181	0.97	VQ				
2+ 0	0.1250	1.00	VQ				
2+ 5	0.1320	1.01	V Q				
2+10	0.1390	1.02	V Q				
2+15	0.1460	1.02	V Q				
2+20	0.1531	1.02	V Q				
2+25	0.1601	1.02	V Q				
2+30	0.1671	1.02	V Q				
2+35	0.1748	1.11	|VQ				
2+40	0.1832	1.23	|VQ				
2+45	0.1919	1.26	|VQ				
2+50	0.2006	1.27	|VQ				
2+55	0.2094	1.27	|VQ				
3+ 0	0.2181	1.28	|VQ				
3+ 5	0.2269	1.28	|VQ				
3+10	0.2357	1.28	|VQ				
3+15	0.2445	1.28	|VQ				
3+20	0.2533	1.28	|VQ				
3+25	0.2621	1.28	|VQ				
3+30	0.2709	1.28	|VQ				
3+35	0.2797	1.28	|VQ				
3+40	0.2885	1.28	|VQ				
3+45	0.2972	1.28	|VQ				
3+50	0.3066	1.36	|VQ				
3+55	0.3168	1.48	|VQ				
4+ 0	0.3272	1.51	|V Q				
4+ 5	0.3377	1.52	|V Q				
4+10	0.3483	1.53	| VQ				
4+15	0.3588	1.53	| VQ				
4+20	0.3700	1.62	| VQ				
4+25	0.3819	1.74	| VQ				
4+30	0.3941	1.77	| VQ				
4+35	0.4063	1.78	| VQ				
4+40	0.4186	1.78	| VQ				
4+45	0.4309	1.79	| VQ				
4+50	0.4438	1.87	| VQ				
4+55	0.4575	1.99	| VQ				
5+ 0	0.4715	2.02	| V Q				

5+ 5	0.4843	1.86	VQ				
5+10	0.4955	1.63	VQ				
5+15	0.5063	1.57	VQ				
5+20	0.5176	1.64	Q				
5+25	0.5296	1.74	Q				
5+30	0.5417	1.77	Q				
5+35	0.5546	1.86	Q				
5+40	0.5683	1.99	Q				
5+45	0.5822	2.02	VQ				
5+50	0.5962	2.03	VQ				
5+55	0.6103	2.04	VQ				
6+ 0	0.6243	2.04	VQ				
6+ 5	0.6390	2.13	VQ				
6+10	0.6545	2.25	VQ				
6+15	0.6701	2.28	VQ				
6+20	0.6859	2.29	Q				
6+25	0.7017	2.29	Q				
6+30	0.7175	2.30	Q				
6+35	0.7339	2.38	Q				
6+40	0.7512	2.50	VQ				
6+45	0.7686	2.53	VQ				
6+50	0.7861	2.54	VQ				
6+55	0.8037	2.55	VQ				
7+ 0	0.8213	2.55	VQ				
7+ 5	0.8388	2.55	VQ				
7+10	0.8564	2.55	Q				
7+15	0.8740	2.55	Q				
7+20	0.8923	2.66	Q				
7+25	0.9117	2.81	Q				
7+30	0.9314	2.86	Q				
7+35	0.9522	3.02	VQ				
7+40	0.9745	3.24	VQ				
7+45	0.9972	3.30	VQ				
7+50	1.0211	3.47	VQ				
7+55	1.0465	3.69	VQ				
8+ 0	1.0723	3.75	VQ				
8+ 5	1.1002	4.06	V Q				
8+10	1.1311	4.48	V Q				
8+15	1.1627	4.59	V Q				
8+20	1.1946	4.63	V Q				
8+25	1.2267	4.66	V Q				
8+30	1.2589	4.68	V Q				
8+35	1.2922	4.83	V Q				
8+40	1.3269	5.04	V Q				
8+45	1.3620	5.09	V Q				
8+50	1.3983	5.27	V Q				
8+55	1.4360	5.48	V Q				
9+ 0	1.4742	5.54	V |Q				
9+ 5	1.5146	5.86	V |Q				
9+10	1.5578	6.28	V| Q				
9+15	1.6018	6.38	V| Q				
9+20	1.6470	6.58	V| Q				
9+25	1.6939	6.80	V| Q				
9+30	1.7412	6.87	V Q				
9+35	1.7896	7.04	V Q				
9+40	1.8396	7.26	V Q				
9+45	1.8900	7.31	|V Q				
9+50	1.9415	7.49	|V Q				
9+55	1.9946	7.70	|V Q				
10+ 0	2.0481	7.76	|V Q				

10+ 5	2.0947	6.78		VQ			
10+10	2.1320	5.40		Q V			
10+15	2.1670	5.09		Q V			
10+20	2.2011	4.95		Q| V			
10+25	2.2348	4.89		Q| V			
10+30	2.2683	4.86		Q| V			
10+35	2.3068	5.59		|Q V			
10+40	2.3523	6.60		| Q			
10+45	2.3994	6.84		| QV			
10+50	2.4472	6.95		| QV			
10+55	2.4954	7.00		| Q			
11+ 0	2.5439	7.04		| Q			
11+ 5	2.5914	6.90		| Q V			
11+10	2.6376	6.71		| Q V			
11+15	2.6835	6.67		| Q V			
11+20	2.7293	6.65		| Q V			
11+25	2.7751	6.65		| Q V			
11+30	2.8210	6.65		| Q V			
11+35	2.8648	6.37		| Q V			
11+40	2.9060	5.98		|Q V			
11+45	2.9466	5.89		|Q V			
11+50	2.9880	6.00		| Q V			
11+55	3.0306	6.19		| Q V			
12+ 0	3.0735	6.23		| Q V			
12+ 5	3.1236	7.27		| Q V			
12+10	3.1834	8.68		| QV			
12+15	3.2456	9.02		| QV|		
12+20	3.3097	9.32		| QV|		
12+25	3.3758	9.59		| Q|		
12+30	3.4425	9.68		| QV			
12+35	3.5113	10.00		| QV			
12+40	3.5830	10.41		| Q			
12+45	3.6554	10.52		| |Q			
12+50	3.7292	10.71		| |Q			
12+55	3.8045	10.93		| |QV			
13+ 0	3.8802	11.00		| |QV			
13+ 5	3.9611	11.75		| | Q			
13+10	4.0489	12.76		| | V Q			
13+15	4.1385	13.00		| | V Q			
13+20	4.2288	13.11		| | V Q			
13+25	4.3195	13.17		| | VQ			
13+30	4.4103	13.20		| | VQ			
13+35	4.4903	11.61		| | Q V			
13+40	4.5553	9.43		| Q | V			
13+45	4.6167	8.92		| Q | V			
13+50	4.6767	8.71		| Q | V			
13+55	4.7359	8.60		| Q | V			
14+ 0	4.7949	8.56		| Q | V			
14+ 5	4.8578	9.14		| Q | V			
14+10	4.9263	9.94		| Q| V			
14+15	4.9961	10.14		| Q V|		
14+20	5.0655	10.08		| Q V|		
14+25	5.1339	9.93		| Q| V		
14+30	5.2021	9.90		| Q| V		
14+35	5.2702	9.89		| Q| V		
14+40	5.3383	9.89		| Q| |V		
14+45	5.4064	9.89		| Q| |V		
14+50	5.4735	9.75		| Q| | V		
14+55	5.5393	9.56		| Q| | V		
15+ 0	5.6049	9.52		| Q| | V		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15+35 6.0327 8.11
15+40 6.0830 7.31
15+45 6.1320 7.12
15+50 6.1805 7.04
15+55 6.2288 7.01
16+ 0 6.2770 7.00
16+ 5 6.3112 4.97
16+10 6.3262 2.17
16+15 6.3366 1.52
16+20 6.3451 1.23
16+25 6.3526 1.09
16+30 6.3596 1.02
16+35 6.3660 0.93
16+40 6.3716 0.81
16+45 6.3770 0.79
16+50 6.3824 0.77
16+55 6.3877 0.77
17+ 0 6.3929 0.77
17+ 5 6.3994 0.94
17+10 6.4075 1.18
17+15 6.4160 1.23
17+20 6.4247 1.26
17+25 6.4334 1.27
17+30 6.4422 1.28
17+35 6.4510 1.28
17+40 6.4598 1.28
17+45 6.4686 1.28
17+50 6.4768 1.19
17+55 6.4842 1.07
18+ 0 6.4913 1.04
18+ 5 6.4984 1.03
18+10 6.5055 1.02
18+15 6.5125 1.02
18+20 6.5196 1.02
18+25 6.5266 1.02
18+30 6.5336 1.02
18+35 6.5400 0.93
18+40 6.5457 0.81
18+45 6.5511 0.79
18+50 6.5558 0.69
18+55 6.5597 0.56
19+ 0 6.5634 0.53
19+ 5 6.5675 0.61
19+10 6.5725 0.72
19+15 6.5776 0.74
19+20 6.5834 0.84
19+25 6.5901 0.97
19+30 6.5970 1.00
19+35 6.6034 0.93
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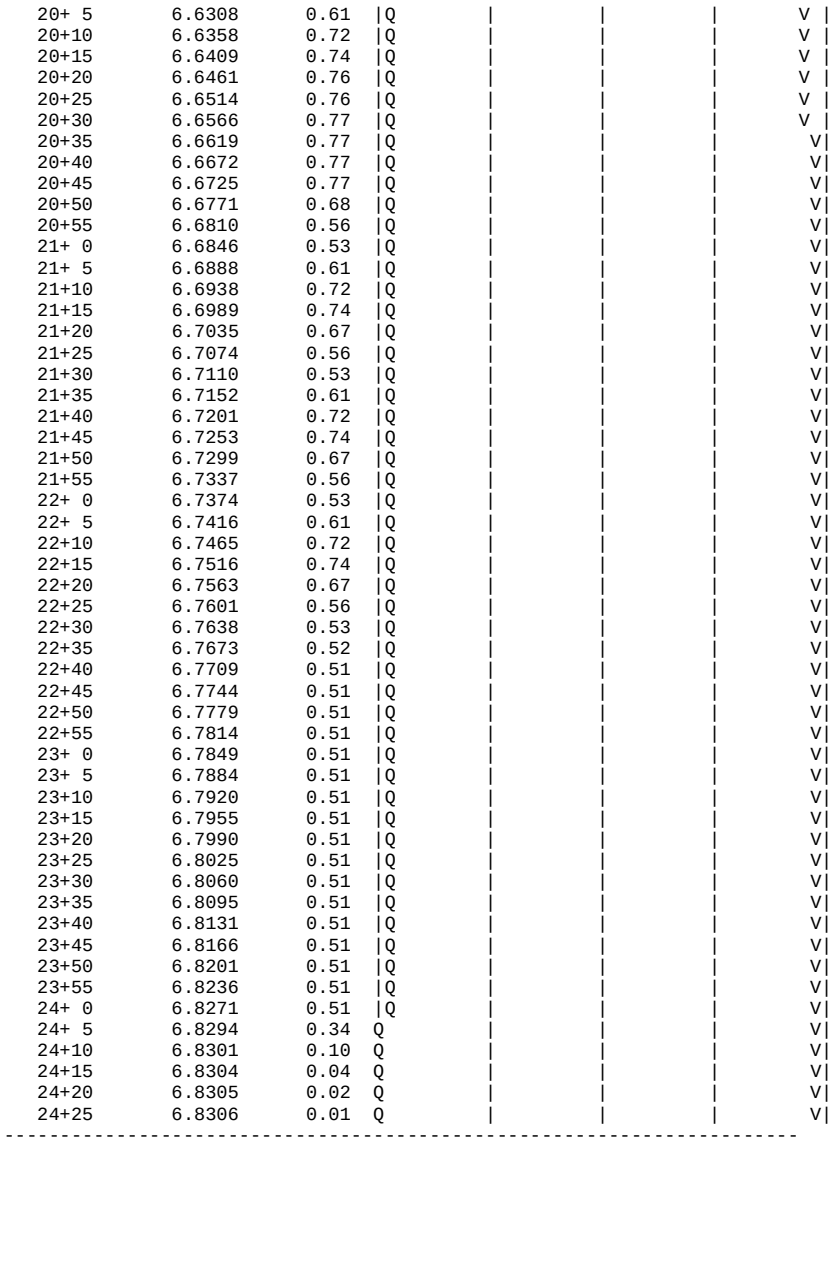
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20+10 6.6358 0.72
20+15 6.6409 0.74
20+20 6.6461 0.76
20+25 6.6514 0.76
20+30 6.6566 0.77
20+35 6.6619 0.77
20+40 6.6672 0.77
20+45 6.6725 0.77
20+50 6.6771 0.68
20+55 6.6810 0.56
21+ 0 6.6846 0.53
21+ 5 6.6888 0.61
21+10 6.6938 0.72
21+15 6.6989 0.74
21+20 6.7035 0.67
21+25 6.7074 0.56
21+30 6.7110 0.53
21+35 6.7152 0.61
21+40 6.7201 0.72
21+45 6.7253 0.74
21+50 6.7299 0.67
21+55 6.7337 0.56
22+ 0 6.7374 0.53
22+ 5 6.7416 0.61
22+10 6.7465 0.72
22+15 6.7516 0.74
22+20 6.7563 0.67
22+25 6.7601 0.56
22+30 6.7638 0.53
22+35 6.7673 0.52
22+40 6.7709 0.51
22+45 6.7744 0.51
22+50 6.7779 0.51
22+55 6.7814 0.51
23+ 0 6.7849 0.51
23+ 5 6.7884 0.51
23+10 6.7920 0.51
23+15 6.7955 0.51
23+20 6.7990 0.51
23+25 6.8025 0.51
23+30 6.8060 0.51
23+35 6.8095 0.51
23+40 6.8131 0.51
23+45 6.8166 0.51
23+50 6.8201 0.51
23+55 6.8236 0.51
24+ 0 6.8271 0.51
24+ 5 6.8294 0.34
24+10 6.8301 0.10
24+15 6.8304 0.04
24+20 6.8305 0.02
24+25 6.8306 0.01

100-YEAR, (1-HR, 3-HR, 6-HR, & 24HR) STORMS

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/09/23 File: vbuhpro1100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Proposed Condition (Area B) 100yr, 1hr Storm
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1894.50(Ft.)
Length along longest watercourse measured to centroid = 666.90(Ft.)
Length along longest watercourse = 0.359 Mi.
Length along longest watercourse measured to centroid = 0.126 Mi.
Difference in elevation = 15.50(Ft.)
Slope along watercourse = 43.1987 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.054 Hr.
Lag time = 3.26 Min.
25% of lag time = 0.81 Min.
40% of lag time = 1.30 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	0.49	15.05

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	1.65	51.10

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.486(In)
Area Averaged 100-Year Rainfall = 1.650(In)

Point rain (area averaged) = 1.650(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 1.650(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.210	89.00	0.050
2.100	98.00	0.900
26.660	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
89.0	95.6	0.057	0.050	0.055	0.071	0.004
98.0	99.2	0.010	0.900	0.002	0.068	0.000
92.0	96.8	0.042	0.650	0.017	0.861	0.015
					Sum (F) =	0.019

Area averaged mean soil loss (F) (In/Hr) = 0.019
Minimum soil loss rate ((In/Hr)) = 0.009
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.400

Slope of intensity-duration curve for a 1 hour storm =0.5000

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	153.415	33.991	10.609
2	0.167	306.829	46.758	14.594
3	0.250	460.244	10.986	3.429
4	0.333	613.658	4.781	1.492
5	0.417	767.073	2.370	0.740
6	0.500	920.487	1.114	0.348
		Sum = 100.000	Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.20	0.831	0.019	(0.333)	0.812
2	0.17	4.30	0.851	0.019	(0.340)	0.832
3	0.25	5.00	0.990	0.019	(0.396)	0.971
4	0.33	5.00	0.990	0.019	(0.396)	0.971
5	0.42	5.80	1.148	0.019	(0.459)	1.129
6	0.50	6.50	1.287	0.019	(0.515)	1.268
7	0.58	7.40	1.465	0.019	(0.586)	1.446

```
 8   0.67     8.60      1.702          0.019    (  0.681)        1.683
 9   0.75    12.30      2.435          0.019    (  0.974)        2.416
10   0.83    29.10      5.760          0.019    (  2.304)        5.741
11   0.92     6.80      1.346          0.019    (  0.538)        1.327
12   1.00     5.00      0.990          0.019    (  0.396)        0.971
               (Loss Rate Not Used)
   Sum =     100.0                                  Sum =    19.6
      Flood volume = Effective rainfall      1.63(In)
       times area      31.0(Ac.)/[(In)/(Ft.)] =       4.2(Ac.Ft)
      Total soil loss =      0.02(In)
      Total soil loss =     0.049(Ac.Ft)
      Total rainfall =      1.65(In)
      Flood volume =      183318.7 Cubic Feet
      Total soil loss =        2124.0 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =    110.232(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          1 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
 ------------------------------------------------------------------------
   0+ 5       0.0594      8.62  VQ        |         |         |         |
   0+10       0.2019     20.70  |V  Q     |         |         |         |
   0+15       0.3758     25.25  |  V Q    |         |         |         |
   0+20       0.5724     28.55  |    Q    |         |         |         |
   0+25       0.7882     31.34  |     QV  |         |         |         |
   0+30       1.0336     35.62  |      Q V|         |         |         |
   0+35       1.3104     40.19  |       Q | V       |         |         |
   0+40       1.6277     46.07  |        Q|    V    |         |         |
   0+45       2.0289     58.25  |         |Q       V|         |         |
   0+50       2.7553    105.48  |         |         |Q    V   |         |
   0+55       3.5145    110.23  |         |         | Q       |  V      |
   1+ 0       3.8915     54.74  |         Q         |         |     V   |
   1+ 5       4.0958     29.67  |    Q    |         |         |       V |
   1+10       4.1675     10.40  | Q       |         |         |        V|
   1+15       4.1980      4.43  Q         |         |         |        V|
   1+20       4.2061      1.18  Q         |         |         |        V|
   1+25       4.2084      0.34  Q         |         |         |         V
------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/09/23 File: vbuhpro3100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Proposed Condition (Area B) 100yr, 3hr Storm
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1894.50(Ft.)
Length along longest watercourse measured to centroid = 666.90(Ft.)
Length along longest watercourse = 0.359 Mi.
Length along longest watercourse measured to centroid = 0.126 Mi.
Difference in elevation = 15.50(Ft.)
Slope along watercourse = 43.1987 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.054 Hr.
Lag time = 3.26 Min.
25% of lag time = 0.81 Min.
40% of lag time = 1.30 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	0.83	25.86

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	2.23	69.06

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.835(In)
Area Averaged 100-Year Rainfall = 2.230(In)

Point rain (area averaged) = 2.230(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 2.230(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.210	89.00	0.050
2.100	98.00	0.900
26.660	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
89.0	95.6	0.057	0.050	0.055	0.071	0.004
98.0	99.2	0.010	0.900	0.002	0.068	0.000
92.0	96.8	0.042	0.650	0.017	0.861	0.015
					Sum (F) =	0.019

Area averaged mean soil loss (F) (In/Hr) = 0.019
Minimum soil loss rate ((In/Hr)) = 0.009
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.400

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	153.415	33.991	10.609
2	0.167	306.829	46.758	14.594
3	0.250	460.244	10.986	3.429
4	0.333	613.658	4.781	1.492
5	0.417	767.073	2.370	0.740
6	0.500	920.487	1.114	0.348
		Sum = 100.000	Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.348	0.019	(0.139)	0.329
2	0.17	1.30	0.348	0.019	(0.139)	0.329
3	0.25	1.10	0.294	0.019	(0.118)	0.275
4	0.33	1.50	0.401	0.019	(0.161)	0.382
5	0.42	1.50	0.401	0.019	(0.161)	0.382
6	0.50	1.80	0.482	0.019	(0.193)	0.463
7	0.58	1.50	0.401	0.019	(0.161)	0.382
8	0.67	1.80	0.482	0.019	(0.193)	0.463
9	0.75	1.80	0.482	0.019	(0.193)	0.463

10	0.83	1.50	0.401	0.019	(0.161)	0.382
11	0.92	1.60	0.428	0.019	(0.171)	0.409
12	1.00	1.80	0.482	0.019	(0.193)	0.463
13	1.08	2.20	0.589	0.019	(0.235)	0.570
14	1.17	2.20	0.589	0.019	(0.235)	0.570
15	1.25	2.20	0.589	0.019	(0.235)	0.570
16	1.33	2.00	0.535	0.019	(0.214)	0.516
17	1.42	2.60	0.696	0.019	(0.278)	0.677
18	1.50	2.70	0.722	0.019	(0.289)	0.704
19	1.58	2.40	0.642	0.019	(0.257)	0.623
20	1.67	2.70	0.722	0.019	(0.289)	0.704
21	1.75	3.30	0.883	0.019	(0.353)	0.864
22	1.83	3.10	0.829	0.019	(0.332)	0.811
23	1.92	2.90	0.776	0.019	(0.310)	0.757
24	2.00	3.00	0.803	0.019	(0.321)	0.784
25	2.08	3.10	0.829	0.019	(0.332)	0.811
26	2.17	4.20	1.124	0.019	(0.450)	1.105
27	2.25	5.00	1.338	0.019	(0.535)	1.319
28	2.33	3.50	0.936	0.019	(0.375)	0.918
29	2.42	6.80	1.819	0.019	(0.728)	1.801
30	2.50	7.30	1.953	0.019	(0.781)	1.934
31	2.58	8.20	2.194	0.019	(0.878)	2.175
32	2.67	5.90	1.579	0.019	(0.631)	1.560
33	2.75	2.00	0.535	0.019	(0.214)	0.516
34	2.83	1.80	0.482	0.019	(0.193)	0.463
35	2.92	1.80	0.482	0.019	(0.193)	0.463
36	3.00	0.60	0.161	0.019	(0.064)	0.142

(Loss Rate Not Used)

Sum = 100.0 Sum = 26.1

Flood volume = Effective rainfall 2.17(In)
times area 31.0(Ac.)/[(In)/(Ft.)] = 5.6(Ac.Ft)
Total soil loss = 0.06(In)
Total soil loss = 0.146(Ac.Ft)
Total rainfall = 2.23(In)
Flood volume = 244293.0 Cubic Feet
Total soil loss = 6372.1 Cubic Feet

Peak flow rate of this hydrograph = 60.241(CFS)

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3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	17.5	35.0	52.5	70.0
0+ 5	0.0240	3.49	VQ	|	|	|	|
0+10	0.0812	8.29	V Q	|	|	|	|
0+15	0.1422	8.86	|V Q	|	|	|	|
0+20	0.2090	9.70	|V Q	|	|	|	|
0+25	0.2870	11.32	| V Q	|	|	|	|
0+30	0.3736	12.58	| V Q	|	|	|	|
0+35	0.4632	13.02	| V Q	|	|	|	|
0+40	0.5530	13.03	| V Q	|	|	|	|
0+45	0.6500	14.09	| V Q	|	|	|	|
0+50	0.7426	13.45	| V Q	|	|	|	|
0+55	0.8298	12.65	| V Q	|	|	|	|
1+ 0	0.9218	13.37	| VQ	|	|	|	|
1+ 5	1.0271	15.28	| VQ	|	|	|	|
1+10	1.1442	17.01	| VQ	|	|	|	|
1+15	1.2644	17.45	| Q	|	|	|	|
1+20	1.3821	17.09	| Q	|	|	|	|
1+25	1.5068	18.11	| Q	|	|	|	|
1+30	1.6486	20.59	| Q	|	|	|	|
1+35	1.7905	20.60	| QV	|	|	|	|
1+40	1.9322	20.57	| Q V	|	|	|	|
1+45	2.0927	23.31	| QV	|	|	|	|
1+50	2.2671	25.32	| Q V	|	|	|	|
1+55	2.4365	24.59	| Q V	|	|	|	|
2+ 0	2.6030	24.18	| Q V	|	|	|	|
2+ 5	2.7734	24.74	| Q V	|	|	|	|
2+10	2.9682	28.28	| Q |V	|	|	|	|
2+15	3.2087	34.93	| Q| V	|	|	|	|
2+20	3.4487	34.84	| Q| V	|	|	|	|
2+25	3.7211	39.56	| Q V	|	|	|	|
2+30	4.0864	53.04	| VQ	|	|	|	|
2+35	4.5013	60.24	| V Q	|	|	|	|
2+40	4.9061	58.78	| QV	|	|	|	|
2+45	5.1834	40.26	| Q	|	|	|	|
2+50	5.3425	23.11	| Q	|	|	|	|
2+55	5.4668	18.05	| Q	|	|	|	|
3+ 0	5.5531	12.53	| Q	|	|	|	|
3+ 5	5.5894	5.27	Q |	|	|	|	|
3+10	5.6011	1.70	Q |	|	|	|	|
3+15	5.6060	0.71	Q |	|	|	|	|
3+20	5.6079	0.27	Q |	|	|	|	|
3+25	5.6082	0.05	Q |	|	|	|	|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/09/23 File: vbuhpro6100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Proposed Condition (Area B) 100yr, 6hr Storm
5/9/23

Drainage Area = 30.97(Ac.) = 0.048 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1894.50(Ft.)
Length along longest watercourse measured to centroid = 666.90(Ft.)
Length along longest watercourse = 0.359 Mi.
Length along longest watercourse measured to centroid = 0.126 Mi.
Difference in elevation = 15.50(Ft.)
Slope along watercourse = 43.1987 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.054 Hr.
Lag time = 3.26 Min.
25% of lag time = 0.81 Min.
40% of lag time = 1.30 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	1.16	35.93

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	2.89	89.50

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.160(In)
Area Averaged 100-Year Rainfall = 2.890(In)

Point rain (area averaged) = 2.890(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 2.890(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.210	89.00	0.050
2.100	98.00	0.900
26.660	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
89.0	95.6	0.057	0.050	0.055	0.071	0.004
98.0	99.2	0.010	0.900	0.002	0.068	0.000
92.0	96.8	0.042	0.650	0.017	0.861	0.015
					Sum (F) =	0.019

Area averaged mean soil loss (F) (In/Hr) = 0.019
Minimum soil loss rate ((In/Hr)) = 0.009
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.400

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	153.415	33.991	10.609
2	0.167	306.829	46.758	14.594
3	0.250	460.244	10.986	3.429
4	0.333	613.658	4.781	1.492
5	0.417	767.073	2.370	0.740
6	0.500	920.487	1.114	0.348
		Sum = 100.000	Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.173	0.019	(0.069)	0.154
2	0.17	0.60	0.208	0.019	(0.083)	0.189
3	0.25	0.60	0.208	0.019	(0.083)	0.189
4	0.33	0.60	0.208	0.019	(0.083)	0.189
5	0.42	0.60	0.208	0.019	(0.083)	0.189
6	0.50	0.70	0.243	0.019	(0.097)	0.224
7	0.58	0.70	0.243	0.019	(0.097)	0.224
8	0.67	0.70	0.243	0.019	(0.097)	0.224
9	0.75	0.70	0.243	0.019	(0.097)	0.224

10	0.83	0.70	0.243	0.019	(0.097)	0.224
11	0.92	0.70	0.243	0.019	(0.097)	0.224
12	1.00	0.80	0.277	0.019	(0.111)	0.259
13	1.08	0.80	0.277	0.019	(0.111)	0.259
14	1.17	0.80	0.277	0.019	(0.111)	0.259
15	1.25	0.80	0.277	0.019	(0.111)	0.259
16	1.33	0.80	0.277	0.019	(0.111)	0.259
17	1.42	0.80	0.277	0.019	(0.111)	0.259
18	1.50	0.80	0.277	0.019	(0.111)	0.259
19	1.58	0.80	0.277	0.019	(0.111)	0.259
20	1.67	0.80	0.277	0.019	(0.111)	0.259
21	1.75	0.80	0.277	0.019	(0.111)	0.259
22	1.83	0.80	0.277	0.019	(0.111)	0.259
23	1.92	0.80	0.277	0.019	(0.111)	0.259
24	2.00	0.90	0.312	0.019	(0.125)	0.293
25	2.08	0.80	0.277	0.019	(0.111)	0.259
26	2.17	0.90	0.312	0.019	(0.125)	0.293
27	2.25	0.90	0.312	0.019	(0.125)	0.293
28	2.33	0.90	0.312	0.019	(0.125)	0.293
29	2.42	0.90	0.312	0.019	(0.125)	0.293
30	2.50	0.90	0.312	0.019	(0.125)	0.293
31	2.58	0.90	0.312	0.019	(0.125)	0.293
32	2.67	0.90	0.312	0.019	(0.125)	0.293
33	2.75	1.00	0.347	0.019	(0.139)	0.328
34	2.83	1.00	0.347	0.019	(0.139)	0.328
35	2.92	1.00	0.347	0.019	(0.139)	0.328
36	3.00	1.00	0.347	0.019	(0.139)	0.328
37	3.08	1.00	0.347	0.019	(0.139)	0.328
38	3.17	1.10	0.381	0.019	(0.153)	0.363
39	3.25	1.10	0.381	0.019	(0.153)	0.363
40	3.33	1.10	0.381	0.019	(0.153)	0.363
41	3.42	1.20	0.416	0.019	(0.166)	0.397
42	3.50	1.30	0.451	0.019	(0.180)	0.432
43	3.58	1.40	0.485	0.019	(0.194)	0.467
44	3.67	1.40	0.485	0.019	(0.194)	0.467
45	3.75	1.50	0.520	0.019	(0.208)	0.501
46	3.83	1.50	0.520	0.019	(0.208)	0.501
47	3.92	1.60	0.555	0.019	(0.222)	0.536
48	4.00	1.60	0.555	0.019	(0.222)	0.536
49	4.08	1.70	0.589	0.019	(0.236)	0.571
50	4.17	1.80	0.624	0.019	(0.250)	0.605
51	4.25	1.90	0.659	0.019	(0.264)	0.640
52	4.33	2.00	0.694	0.019	(0.277)	0.675
53	4.42	2.10	0.728	0.019	(0.291)	0.709
54	4.50	2.10	0.728	0.019	(0.291)	0.709
55	4.58	2.20	0.763	0.019	(0.305)	0.744
56	4.67	2.30	0.798	0.019	(0.319)	0.779
57	4.75	2.40	0.832	0.019	(0.333)	0.813
58	4.83	2.40	0.832	0.019	(0.333)	0.813
59	4.92	2.50	0.867	0.019	(0.347)	0.848
60	5.00	2.60	0.902	0.019	(0.361)	0.883
61	5.08	3.10	1.075	0.019	(0.430)	1.056
62	5.17	3.60	1.248	0.019	(0.499)	1.229
63	5.25	3.90	1.352	0.019	(0.541)	1.333
64	5.33	4.20	1.456	0.019	(0.583)	1.438
65	5.42	4.70	1.630	0.019	(0.652)	1.611
66	5.50	5.60	1.942	0.019	(0.777)	1.923
67	5.58	1.90	0.659	0.019	(0.264)	0.640
68	5.67	0.90	0.312	0.019	(0.125)	0.293
69	5.75	0.60	0.208	0.019	(0.083)	0.189
70	5.83	0.50	0.173	0.019	(0.069)	0.154
71	5.92	0.30	0.104	0.019	(0.042)	0.085
72	6.00	0.20	0.069	0.019	(0.028)	0.050

(Loss Rate Not Used)

Sum = 100.0 Sum = 33.3

Flood volume = Effective rainfall 2.78(In)
times area 31.0(Ac.)/[(In)/(Ft.)] = 7.2(Ac.Ft)
Total soil loss = 0.11(In)
Total soil loss = 0.293(Ac.Ft)
Total rainfall = 2.89(In)
Flood volume = 312118.2 Cubic Feet
Total soil loss = 12744.2 Cubic Feet

Peak flow rate of this hydrograph = 52.134(CFS)

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6 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	15.0	30.0	45.0	60.0
0+ 5	0.0113	1.64	VQ	|	|	|	|
0+10	0.0407	4.26	V Q	|	|	|	|
0+15	0.0772	5.30	V Q	|	|	|	|
0+20	0.1161	5.65	V Q	|	|	|	|
0+25	0.1561	5.82	V Q	|	|	|	|
0+30	0.1993	6.26	|V Q	|	|	|	|
0+35	0.2460	6.78	|V Q	|	|	|	|
0+40	0.2935	6.90	|V Q	|	|	|	|
0+45	0.3414	6.95	|V Q	|	|	|	|
0+50	0.3894	6.98	| V Q	|	|	|	|
0+55	0.4376	6.99	| V Q	|	|	|	|
1+ 0	0.4882	7.36	| V Q	|	|	|	|
1+ 5	0.5424	7.86	| V Q	|	|	|	|
1+10	0.5974	7.98	| V Q	|	|	|	|
1+15	0.6527	8.04	| V Q	|	|	|	|
1+20	0.7082	8.06	| V Q	|	|	|	|
1+25	0.7638	8.07	| VQ	|	|	|	|
1+30	0.8194	8.07	| VQ	|	|	|	|
1+35	0.8750	8.07	| VQ	|	|	|	|
1+40	0.9306	8.07	| Q	|	|	|	|
1+45	0.9862	8.07	| Q	|	|	|	|
1+50	1.0418	8.07	| Q	|	|	|	|
1+55	1.0974	8.07	| QV	|	|	|	|
2+ 0	1.1556	8.44	| QV	|	|	|	|
2+ 5	1.2147	8.58	| QV	|	|	|	|
2+10	1.2736	8.56	| Q V	|	|	|	|
2+15	1.3356	9.00	| Q V	|	|	|	|
2+20	1.3982	9.09	| QV	|	|	|	|
2+25	1.4611	9.13	| Q V	|	|	|	|
2+30	1.5241	9.14	| Q V	|	|	|	|
2+35	1.5871	9.16	| Q V	|	|	|	|
2+40	1.6502	9.16	| Q V|	|	|	|	|
2+45	1.7158	9.52	| Q V|	|	|	|	|
2+50	1.7849	10.03	| Q V|	|	|	|	|
2+55	1.8547	10.15	| Q V	|	|	|	|
3+ 0	1.9250	10.20	| Q V	|	|	|	|

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   3+ 5       1.9954     10.23  |     Q   |V        |         |         |
   3+10       2.0685     10.61  |      Q  |V        |         |         |
   3+15       2.1450     11.11  |      Q  |V        |         |         |
   3+20       2.2224     11.23  |      Q  | V       |         |         |
   3+25       2.3026     11.65  |      Q  | V       |         |         |
   3+30       2.3891     12.55  |       Q |  V      |         |         |
   3+35       2.4824     13.56  |        Q|  V      |         |         |
   3+40       2.5805     14.23  |        Q|   V     |         |         |
   3+45       2.6824     14.80  |        Q|   V     |         |         |
   3+50       2.7884     15.39  |         Q    V    |         |         |
   3+55       2.8981     15.92  |         Q     V   |         |         |
   4+ 0       3.0116     16.49  |         Q     V   |         |         |
   4+ 5       3.1287     17.00  |         |Q     V  |         |         |
   4+10       3.2523     17.94  |         |Q      V |         |         |
   4+15       3.3829     18.96  |         | Q     V |         |         |
   4+20       3.5207     20.02  |         |  Q     V|         |         |
   4+25       3.6660     21.09  |         |   Q     V         |         |
   4+30       3.8161     21.80  |         |   Q     |V        |         |
   4+35       3.9702     22.38  |         |   Q     | V       |         |
   4+40       4.1310     23.34  |         |    Q    |  V      |         |
   4+45       4.2989     24.37  |         |     Q   |  V      |         |
   4+50       4.4715     25.06  |         |     Q   |   V     |         |
   4+55       4.6480     25.63  |         |      Q  |    V    |         |
   5+ 0       4.8311     26.59  |         |      Q  |     V   |         |
   5+ 5       5.0315     29.10  |         |        Q|       V |         |
   5+10       5.2632     33.65  |         |         | Q      V|         |
   5+15       5.5247     37.96  |         |         |    Q    V         |
   5+20       5.8103     41.47  |         |         |      Q  | V       |
   5+25       6.1243     45.59  |         |         |        Q  V       |
   5+30       6.4833     52.13  |         |         |         |  Q V    |
   5+35       6.7861     43.96  |         |         |        Q|     V   |
   5+40       6.9444     22.99  |         |    Q    |         |      V  |
   5+45       7.0342     13.05  |       Q |         |         |       V |
   5+50       7.0917      8.35  |    Q    |         |         |       V |
   5+55       7.1288      5.39  |  Q      |         |         |       V |
   6+ 0       7.1497      3.03  | Q       |         |         |       V |
   6+ 5       7.1600      1.50  |Q        |         |         |       V |
   6+10       7.1633      0.48  Q         |         |         |       V |
   6+15       7.1647      0.19  Q         |         |         |       V |
   6+20       7.1651      0.07  Q         |         |         |       V |
   6+25       7.1652      0.02  Q         |         |         |       V |
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U n i t H y d r o g r a p h A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

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English Units used in output format

Valle Reseda TR 38066
Unit Hydrograph Method
Proposed Condition (Area B) 100yr, 24hr Storm
5/9/23

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Drainage Area for Depth-Area Areal Adjustment = 30.97(Ac.) = 0.048 Sq. Mi.
Length along longest watercourse = 1894.50(Ft.)
Length along longest watercourse measured to centroid = 666.90(Ft.)
Length along longest watercourse = 0.359 Mi.
Length along longest watercourse measured to centroid = 0.126 Mi.
Difference in elevation = 15.50(Ft.)
Slope along watercourse = 43.1987 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.054 Hr.
Lag time = 3.26 Min.
25% of lag time = 0.81 Min.
40% of lag time = 1.30 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	2.04	63.18

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
30.97	5.36	166.00

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.040(In)
Area Averaged 100-Year Rainfall = 5.360(In)

Point rain (area averaged) = 5.360(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 5.360(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.210	89.00	0.050
2.100	98.00	0.900
26.660	92.00	0.650

Total Area Entered = 30.97(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
89.0	95.6	0.057	0.050	0.055	0.071	0.004
98.0	99.2	0.010	0.900	0.002	0.068	0.000
92.0	96.8	0.042	0.650	0.017	0.861	0.015
					Sum (F) =	0.019

Area averaged mean soil loss (F) (In/Hr) = 0.019
Minimum soil loss rate ((In/Hr)) = 0.009
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.400

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	153.415	33.991	10.609
2	0.167	306.829	46.758	14.594
3	0.250	460.244	10.986	3.429
4	0.333	613.658	4.781	1.492
5	0.417	767.073	2.370	0.740
6	0.500	920.487	1.114	0.348
		Sum = 100.000	Sum=	31.212

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.043	(0.033)	0.017	0.026
2	0.17	0.07	0.043	(0.033)	0.017	0.026
3	0.25	0.07	0.043	(0.033)	0.017	0.026
4	0.33	0.10	0.064	(0.033)	0.026	0.039
5	0.42	0.10	0.064	(0.033)	0.026	0.039
6	0.50	0.10	0.064	(0.033)	0.026	0.039
7	0.58	0.10	0.064	(0.033)	0.026	0.039
8	0.67	0.10	0.064	(0.033)	0.026	0.039
9	0.75	0.10	0.064	(0.032)	0.026	0.039

10	0.83	0.13	0.086	0.032	(0.034)	0.053
11	0.92	0.13	0.086	0.032	(0.034)	0.054
12	1.00	0.13	0.086	0.032	(0.034)	0.054
13	1.08	0.10	0.064	(0.032)	0.026	0.039
14	1.17	0.10	0.064	(0.032)	0.026	0.039
15	1.25	0.10	0.064	(0.032)	0.026	0.039
16	1.33	0.10	0.064	(0.032)	0.026	0.039
17	1.42	0.10	0.064	(0.031)	0.026	0.039
18	1.50	0.10	0.064	(0.031)	0.026	0.039
19	1.58	0.10	0.064	(0.031)	0.026	0.039
20	1.67	0.10	0.064	(0.031)	0.026	0.039
21	1.75	0.10	0.064	(0.031)	0.026	0.039
22	1.83	0.13	0.086	0.031	(0.034)	0.055
23	1.92	0.13	0.086	0.031	(0.034)	0.055
24	2.00	0.13	0.086	0.031	(0.034)	0.055
25	2.08	0.13	0.086	0.030	(0.034)	0.055
26	2.17	0.13	0.086	0.030	(0.034)	0.055
27	2.25	0.13	0.086	0.030	(0.034)	0.056
28	2.33	0.13	0.086	0.030	(0.034)	0.056
29	2.42	0.13	0.086	0.030	(0.034)	0.056
30	2.50	0.13	0.086	0.030	(0.034)	0.056
31	2.58	0.17	0.107	0.030	(0.043)	0.077
32	2.67	0.17	0.107	0.030	(0.043)	0.078
33	2.75	0.17	0.107	0.029	(0.043)	0.078
34	2.83	0.17	0.107	0.029	(0.043)	0.078
35	2.92	0.17	0.107	0.029	(0.043)	0.078
36	3.00	0.17	0.107	0.029	(0.043)	0.078
37	3.08	0.17	0.107	0.029	(0.043)	0.078
38	3.17	0.17	0.107	0.029	(0.043)	0.078
39	3.25	0.17	0.107	0.029	(0.043)	0.078
40	3.33	0.17	0.107	0.029	(0.043)	0.079
41	3.42	0.17	0.107	0.029	(0.043)	0.079
42	3.50	0.17	0.107	0.028	(0.043)	0.079
43	3.58	0.17	0.107	0.028	(0.043)	0.079
44	3.67	0.17	0.107	0.028	(0.043)	0.079
45	3.75	0.17	0.107	0.028	(0.043)	0.079
46	3.83	0.20	0.129	0.028	(0.051)	0.101
47	3.92	0.20	0.129	0.028	(0.051)	0.101
48	4.00	0.20	0.129	0.028	(0.051)	0.101
49	4.08	0.20	0.129	0.028	(0.051)	0.101
50	4.17	0.20	0.129	0.027	(0.051)	0.101
51	4.25	0.20	0.129	0.027	(0.051)	0.101
52	4.33	0.23	0.150	0.027	(0.060)	0.123
53	4.42	0.23	0.150	0.027	(0.060)	0.123
54	4.50	0.23	0.150	0.027	(0.060)	0.123
55	4.58	0.23	0.150	0.027	(0.060)	0.123
56	4.67	0.23	0.150	0.027	(0.060)	0.123
57	4.75	0.23	0.150	0.027	(0.060)	0.123
58	4.83	0.27	0.172	0.027	(0.069)	0.145
59	4.92	0.27	0.172	0.026	(0.069)	0.145
60	5.00	0.27	0.172	0.026	(0.069)	0.145
61	5.08	0.20	0.129	0.026	(0.051)	0.102
62	5.17	0.20	0.129	0.026	(0.051)	0.103
63	5.25	0.20	0.129	0.026	(0.051)	0.103
64	5.33	0.23	0.150	0.026	(0.060)	0.124
65	5.42	0.23	0.150	0.026	(0.060)	0.124
66	5.50	0.23	0.150	0.026	(0.060)	0.124
67	5.58	0.27	0.172	0.025	(0.069)	0.146
68	5.67	0.27	0.172	0.025	(0.069)	0.146
69	5.75	0.27	0.172	0.025	(0.069)	0.146
70	5.83	0.27	0.172	0.025	(0.069)	0.146
71	5.92	0.27	0.172	0.025	(0.069)	0.146
72	6.00	0.27	0.172	0.025	(0.069)	0.147
73	6.08	0.30	0.193	0.025	(0.077)	0.168
74	6.17	0.30	0.193	0.025	(0.077)	0.168
75	6.25	0.30	0.193	0.025	(0.077)	0.168
76	6.33	0.30	0.193	0.024	(0.077)	0.168
77	6.42	0.30	0.193	0.024	(0.077)	0.169
78	6.50	0.30	0.193	0.024	(0.077)	0.169
79	6.58	0.33	0.214	0.024	(0.086)	0.190
80	6.67	0.33	0.214	0.024	(0.086)	0.190
81	6.75	0.33	0.214	0.024	(0.086)	0.190
82	6.83	0.33	0.214	0.024	(0.086)	0.191
83	6.92	0.33	0.214	0.024	(0.086)	0.191
84	7.00	0.33	0.214	0.024	(0.086)	0.191
85	7.08	0.33	0.214	0.024	(0.086)	0.191
86	7.17	0.33	0.214	0.023	(0.086)	0.191
87	7.25	0.33	0.214	0.023	(0.086)	0.191
88	7.33	0.37	0.236	0.023	(0.094)	0.213
89	7.42	0.37	0.236	0.023	(0.094)	0.213
90	7.50	0.37	0.236	0.023	(0.094)	0.213
91	7.58	0.40	0.257	0.023	(0.103)	0.234
92	7.67	0.40	0.257	0.023	(0.103)	0.234
93	7.75	0.40	0.257	0.023	(0.103)	0.235
94	7.83	0.43	0.279	0.023	(0.111)	0.256
95	7.92	0.43	0.279	0.022	(0.111)	0.256
96	8.00	0.43	0.279	0.022	(0.111)	0.256
97	8.08	0.50	0.322	0.022	(0.129)	0.299
98	8.17	0.50	0.322	0.022	(0.129)	0.299
99	8.25	0.50	0.322	0.022	(0.129)	0.300
100	8.33	0.50	0.322	0.022	(0.129)	0.300
101	8.42	0.50	0.322	0.022	(0.129)	0.300
102	8.50	0.50	0.322	0.022	(0.129)	0.300
103	8.58	0.53	0.343	0.022	(0.137)	0.321
104	8.67	0.53	0.343	0.022	(0.137)	0.321
105	8.75	0.53	0.343	0.021	(0.137)	0.322
106	8.83	0.57	0.364	0.021	(0.146)	0.343
107	8.92	0.57	0.364	0.021	(0.146)	0.343
108	9.00	0.57	0.364	0.021	(0.146)	0.343
109	9.08	0.63	0.407	0.021	(0.163)	0.386
110	9.17	0.63	0.407	0.021	(0.163)	0.386
111	9.25	0.63	0.407	0.021	(0.163)	0.387
112	9.33	0.67	0.429	0.021	(0.172)	0.408
113	9.42	0.67	0.429	0.021	(0.172)	0.408
114	9.50	0.67	0.429	0.021	(0.172)	0.408
115	9.58	0.70	0.450	0.020	(0.180)	0.430
116	9.67	0.70	0.450	0.020	(0.180)	0.430
117	9.75	0.70	0.450	0.020	(0.180)	0.430
118	9.83	0.73	0.472	0.020	(0.189)	0.452
119	9.92	0.73	0.472	0.020	(0.189)	0.452
120	10.00	0.73	0.472	0.020	(0.189)	0.452
121	10.08	0.50	0.322	0.020	(0.129)	0.302
122	10.17	0.50	0.322	0.020	(0.129)	0.302
123	10.25	0.50	0.322	0.020	(0.129)	0.302
124	10.33	0.50	0.322	0.020	(0.129)	0.302
125	10.42	0.50	0.322	0.019	(0.129)	0.302
126	10.50	0.50	0.322	0.019	(0.129)	0.302
127	10.58	0.67	0.429	0.019	(0.172)	0.409
128	10.67	0.67	0.429	0.019	(0.172)	0.410
129	10.75	0.67	0.429	0.019	(0.172)	0.410

130	10.83	0.67	0.429	0.019	(0.172)	0.410
131	10.92	0.67	0.429	0.019	(0.172)	0.410
132	11.00	0.67	0.429	0.019	(0.172)	0.410
133	11.08	0.63	0.407	0.019	(0.163)	0.389
134	11.17	0.63	0.407	0.019	(0.163)	0.389
135	11.25	0.63	0.407	0.019	(0.163)	0.389
136	11.33	0.63	0.407	0.018	(0.163)	0.389
137	11.42	0.63	0.407	0.018	(0.163)	0.389
138	11.50	0.63	0.407	0.018	(0.163)	0.389
139	11.58	0.57	0.364	0.018	(0.146)	0.346
140	11.67	0.57	0.364	0.018	(0.146)	0.346
141	11.75	0.57	0.364	0.018	(0.146)	0.346
142	11.83	0.60	0.386	0.018	(0.154)	0.368
143	11.92	0.60	0.386	0.018	(0.154)	0.368
144	12.00	0.60	0.386	0.018	(0.154)	0.368
145	12.08	0.83	0.536	0.018	(0.214)	0.518
146	12.17	0.83	0.536	0.018	(0.214)	0.518
147	12.25	0.83	0.536	0.017	(0.214)	0.519
148	12.33	0.87	0.557	0.017	(0.223)	0.540
149	12.42	0.87	0.557	0.017	(0.223)	0.540
150	12.50	0.87	0.557	0.017	(0.223)	0.540
151	12.58	0.93	0.600	0.017	(0.240)	0.583
152	12.67	0.93	0.600	0.017	(0.240)	0.583
153	12.75	0.93	0.600	0.017	(0.240)	0.583
154	12.83	0.97	0.622	0.017	(0.249)	0.605
155	12.92	0.97	0.622	0.017	(0.249)	0.605
156	13.00	0.97	0.622	0.017	(0.249)	0.605
157	13.08	1.13	0.729	0.017	(0.292)	0.712
158	13.17	1.13	0.729	0.017	(0.292)	0.712
159	13.25	1.13	0.729	0.016	(0.292)	0.712
160	13.33	1.13	0.729	0.016	(0.292)	0.713
161	13.42	1.13	0.729	0.016	(0.292)	0.713
162	13.50	1.13	0.729	0.016	(0.292)	0.713
163	13.58	0.77	0.493	0.016	(0.197)	0.477
164	13.67	0.77	0.493	0.016	(0.197)	0.477
165	13.75	0.77	0.493	0.016	(0.197)	0.477
166	13.83	0.77	0.493	0.016	(0.197)	0.477
167	13.92	0.77	0.493	0.016	(0.197)	0.477
168	14.00	0.77	0.493	0.016	(0.197)	0.477
169	14.08	0.90	0.579	0.016	(0.232)	0.563
170	14.17	0.90	0.579	0.016	(0.232)	0.563
171	14.25	0.90	0.579	0.015	(0.232)	0.563
172	14.33	0.87	0.557	0.015	(0.223)	0.542
173	14.42	0.87	0.557	0.015	(0.223)	0.542
174	14.50	0.87	0.557	0.015	(0.223)	0.542
175	14.58	0.87	0.557	0.015	(0.223)	0.542
176	14.67	0.87	0.557	0.015	(0.223)	0.542
177	14.75	0.87	0.557	0.015	(0.223)	0.542
178	14.83	0.83	0.536	0.015	(0.214)	0.521
179	14.92	0.83	0.536	0.015	(0.214)	0.521
180	15.00	0.83	0.536	0.015	(0.214)	0.521
181	15.08	0.80	0.515	0.015	(0.206)	0.500
182	15.17	0.80	0.515	0.015	(0.206)	0.500
183	15.25	0.80	0.515	0.015	(0.206)	0.500
184	15.33	0.77	0.493	0.014	(0.197)	0.479
185	15.42	0.77	0.493	0.014	(0.197)	0.479
186	15.50	0.77	0.493	0.014	(0.197)	0.479
187	15.58	0.63	0.407	0.014	(0.163)	0.393
188	15.67	0.63	0.407	0.014	(0.163)	0.393
189	15.75	0.63	0.407	0.014	(0.163)	0.393
190	15.83	0.63	0.407	0.014	(0.163)	0.393
191	15.92	0.63	0.407	0.014	(0.163)	0.393
192	16.00	0.63	0.407	0.014	(0.163)	0.393
193	16.08	0.13	0.086	0.014	(0.034)	0.072
194	16.17	0.13	0.086	0.014	(0.034)	0.072
195	16.25	0.13	0.086	0.014	(0.034)	0.072
196	16.33	0.13	0.086	0.014	(0.034)	0.072
197	16.42	0.13	0.086	0.014	(0.034)	0.072
198	16.50	0.13	0.086	0.013	(0.034)	0.072
199	16.58	0.10	0.064	0.013	(0.026)	0.051
200	16.67	0.10	0.064	0.013	(0.026)	0.051
201	16.75	0.10	0.064	0.013	(0.026)	0.051
202	16.83	0.10	0.064	0.013	(0.026)	0.051
203	16.92	0.10	0.064	0.013	(0.026)	0.051
204	17.00	0.10	0.064	0.013	(0.026)	0.051
205	17.08	0.17	0.107	0.013	(0.043)	0.094
206	17.17	0.17	0.107	0.013	(0.043)	0.094
207	17.25	0.17	0.107	0.013	(0.043)	0.094
208	17.33	0.17	0.107	0.013	(0.043)	0.094
209	17.42	0.17	0.107	0.013	(0.043)	0.094
210	17.50	0.17	0.107	0.013	(0.043)	0.095
211	17.58	0.17	0.107	0.013	(0.043)	0.095
212	17.67	0.17	0.107	0.013	(0.043)	0.095
213	17.75	0.17	0.107	0.012	(0.043)	0.095
214	17.83	0.13	0.086	0.012	(0.034)	0.073
215	17.92	0.13	0.086	0.012	(0.034)	0.073
216	18.00	0.13	0.086	0.012	(0.034)	0.073
217	18.08	0.13	0.086	0.012	(0.034)	0.074
218	18.17	0.13	0.086	0.012	(0.034)	0.074
219	18.25	0.13	0.086	0.012	(0.034)	0.074
220	18.33	0.13	0.086	0.012	(0.034)	0.074
221	18.42	0.13	0.086	0.012	(0.034)	0.074
222	18.50	0.13	0.086	0.012	(0.034)	0.074
223	18.58	0.10	0.064	0.012	(0.026)	0.052
224	18.67	0.10	0.064	0.012	(0.026)	0.052
225	18.75	0.10	0.064	0.012	(0.026)	0.053
226	18.83	0.07	0.043	0.012	(0.017)	0.031
227	18.92	0.07	0.043	0.012	(0.017)	0.031
228	19.00	0.07	0.043	0.012	(0.017)	0.031
229	19.08	0.10	0.064	0.012	(0.026)	0.053
230	19.17	0.10	0.064	0.011	(0.026)	0.053
231	19.25	0.10	0.064	0.011	(0.026)	0.053
232	19.33	0.13	0.086	0.011	(0.034)	0.074
233	19.42	0.13	0.086	0.011	(0.034)	0.074
234	19.50	0.13	0.086	0.011	(0.034)	0.074
235	19.58	0.10	0.064	0.011	(0.026)	0.053
236	19.67	0.10	0.064	0.011	(0.026)	0.053
237	19.75	0.10	0.064	0.011	(0.026)	0.053
238	19.83	0.07	0.043	0.011	(0.017)	0.032
239	19.92	0.07	0.043	0.011	(0.017)	0.032
240	20.00	0.07	0.043	0.011	(0.017)	0.032
241	20.08	0.10	0.064	0.011	(0.026)	0.053
242	20.17	0.10	0.064	0.011	(0.026)	0.053
243	20.25	0.10	0.064	0.011	(0.026)	0.053
244	20.33	0.10	0.064	0.011	(0.026)	0.054
245	20.42	0.10	0.064	0.011	(0.026)	0.054
246	20.50	0.10	0.064	0.011	(0.026)	0.054
247	20.58	0.10	0.064	0.011	(0.026)	0.054
248	20.67	0.10	0.064	0.011	(0.026)	0.054
249	20.75	0.10	0.064	0.011	(0.026)	0.054

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250  20.83     0.07      0.043          0.011    (  0.017)        0.032
251  20.92     0.07      0.043          0.010    (  0.017)        0.032
252  21.00     0.07      0.043          0.010    (  0.017)        0.032
253  21.08     0.10      0.064          0.010    (  0.026)        0.054
254  21.17     0.10      0.064          0.010    (  0.026)        0.054
255  21.25     0.10      0.064          0.010    (  0.026)        0.054
256  21.33     0.07      0.043          0.010    (  0.017)        0.033
257  21.42     0.07      0.043          0.010    (  0.017)        0.033
258  21.50     0.07      0.043          0.010    (  0.017)        0.033
259  21.58     0.10      0.064          0.010    (  0.026)        0.054
260  21.67     0.10      0.064          0.010    (  0.026)        0.054
261  21.75     0.10      0.064          0.010    (  0.026)        0.054
262  21.83     0.07      0.043          0.010    (  0.017)        0.033
263  21.92     0.07      0.043          0.010    (  0.017)        0.033
264  22.00     0.07      0.043          0.010    (  0.017)        0.033
265  22.08     0.10      0.064          0.010    (  0.026)        0.054
266  22.17     0.10      0.064          0.010    (  0.026)        0.054
267  22.25     0.10      0.064          0.010    (  0.026)        0.054
268  22.33     0.07      0.043          0.010    (  0.017)        0.033
269  22.42     0.07      0.043          0.010    (  0.017)        0.033
270  22.50     0.07      0.043          0.010    (  0.017)        0.033
271  22.58     0.07      0.043          0.010    (  0.017)        0.033
272  22.67     0.07      0.043          0.010    (  0.017)        0.033
273  22.75     0.07      0.043          0.010    (  0.017)        0.033
274  22.83     0.07      0.043          0.010    (  0.017)        0.033
275  22.92     0.07      0.043          0.010    (  0.017)        0.033
276  23.00     0.07      0.043          0.010    (  0.017)        0.033
277  23.08     0.07      0.043          0.010    (  0.017)        0.033
278  23.17     0.07      0.043          0.010    (  0.017)        0.033
279  23.25     0.07      0.043          0.010    (  0.017)        0.033
280  23.33     0.07      0.043          0.010    (  0.017)        0.033
281  23.42     0.07      0.043          0.010    (  0.017)        0.033
282  23.50     0.07      0.043          0.010    (  0.017)        0.033
283  23.58     0.07      0.043          0.009    (  0.017)        0.033
284  23.67     0.07      0.043          0.009    (  0.017)        0.033
285  23.75     0.07      0.043          0.009    (  0.017)        0.033
286  23.83     0.07      0.043          0.009    (  0.017)        0.033
287  23.92     0.07      0.043          0.009    (  0.017)        0.033
288  24.00     0.07      0.043          0.009    (  0.017)        0.033
              (Loss Rate Not Used)
    Sum =     100.0                                Sum =    59.0
       Flood volume = Effective rainfall      4.92(In)
        times area      31.0(Ac.)/[(In)/(Ft.)] =      12.7(Ac.Ft)
       Total soil loss =      0.44(In)
       Total soil loss =     1.140(Ac.Ft)
       Total rainfall =      5.36(In)
       Flood volume =      552876.0 Cubic Feet
       Total soil loss =       49664.6 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =     22.255(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                       R u n o f f     H y d r o g r a p h
       ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

       ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5      30.0
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0+ 5       0.0019      0.27  Q          |          |          |          |
0+10       0.0063      0.65  Q          |          |          |          |
0+15       0.0114      0.74  Q          |          |          |          |
0+20       0.0177      0.91  VQ         |          |          |          |
0+25       0.0254      1.12  VQ         |          |          |          |
0+30       0.0335      1.17  VQ         |          |          |          |
0+35       0.0417      1.19  VQ         |          |          |          |
0+40       0.0500      1.20  VQ         |          |          |          |
0+45       0.0583      1.21  VQ         |          |          |          |
0+50       0.0676      1.36  VQ         |          |          |          |
0+55       0.0785      1.58  V Q        |          |          |          |
1+ 0       0.0898      1.63  V Q        |          |          |          |
1+ 5       0.1001      1.50  VQ         |          |          |          |
1+10       0.1090      1.29  VQ         |          |          |          |
1+15       0.1175      1.24  VQ         |          |          |          |
1+20       0.1260      1.22  VQ         |          |          |          |
1+25       0.1343      1.21  VQ         |          |          |          |
1+30       0.1426      1.21  VQ         |          |          |          |
1+35       0.1509      1.21  VQ         |          |          |          |
1+40       0.1592      1.21  VQ         |          |          |          |
1+45       0.1675      1.21  VQ         |          |          |          |
1+50       0.1770      1.38  VQ         |          |          |          |
1+55       0.1881      1.62  V Q        |          |          |          |
2+ 0       0.1997      1.68  V Q        |          |          |          |
2+ 5       0.2114      1.71  V Q        |          |          |          |
2+10       0.2233      1.72  V Q        |          |          |          |
2+15       0.2352      1.73  V Q        |          |          |          |
2+20       0.2472      1.73  V Q        |          |          |          |
2+25       0.2591      1.74  V Q        |          |          |          |
2+30       0.2711      1.74  V Q        |          |          |          |
2+35       0.2847      1.97  V Q        |          |          |          |
2+40       0.3005      2.29  V  Q       |          |          |          |
2+45       0.3168      2.37  V  Q       |          |          |          |
2+50       0.3334      2.40  |V Q       |          |          |          |
2+55       0.3501      2.42  |V Q       |          |          |          |
3+ 0       0.3668      2.43  |V Q       |          |          |          |
3+ 5       0.3836      2.44  |V Q       |          |          |          |
3+10       0.4004      2.44  |V Q       |          |          |          |
3+15       0.4173      2.45  |V Q       |          |          |          |
3+20       0.4342      2.45  |V Q       |          |          |          |
3+25       0.4511      2.45  |V Q       |          |          |          |
3+30       0.4680      2.46  |V Q       |          |          |          |
3+35       0.4849      2.46  |V Q       |          |          |          |
3+40       0.5019      2.46  |V Q       |          |          |          |
3+45       0.5189      2.47  |V Q       |          |          |          |
3+50       0.5375      2.70  |V Q       |          |          |          |
3+55       0.5583      3.02  |V  Q      |          |          |          |
4+ 0       0.5796      3.09  |V  Q      |          |          |          |
4+ 5       0.6011      3.13  |V  Q      |          |          |          |
4+10       0.6228      3.15  |V  Q      |          |          |          |
4+15       0.6446      3.16  | V Q      |          |          |          |
4+20       0.6679      3.39  | V Q      |          |          |          |
4+25       0.6935      3.71  | V Q      |          |          |          |
4+30       0.7195      3.78  | V  Q     |          |          |          |
4+35       0.7458      3.82  | V  Q     |          |          |          |
4+40       0.7723      3.84  | V  Q     |          |          |          |
4+45       0.7988      3.85  | V  Q     |          |          |          |
4+50       0.8269      4.08  | V  Q     |          |          |          |
4+55       0.8572      4.40  | V  Q     |          |          |          |
5+ 0       0.8880      4.48  | V  Q     |          |          |          |
```
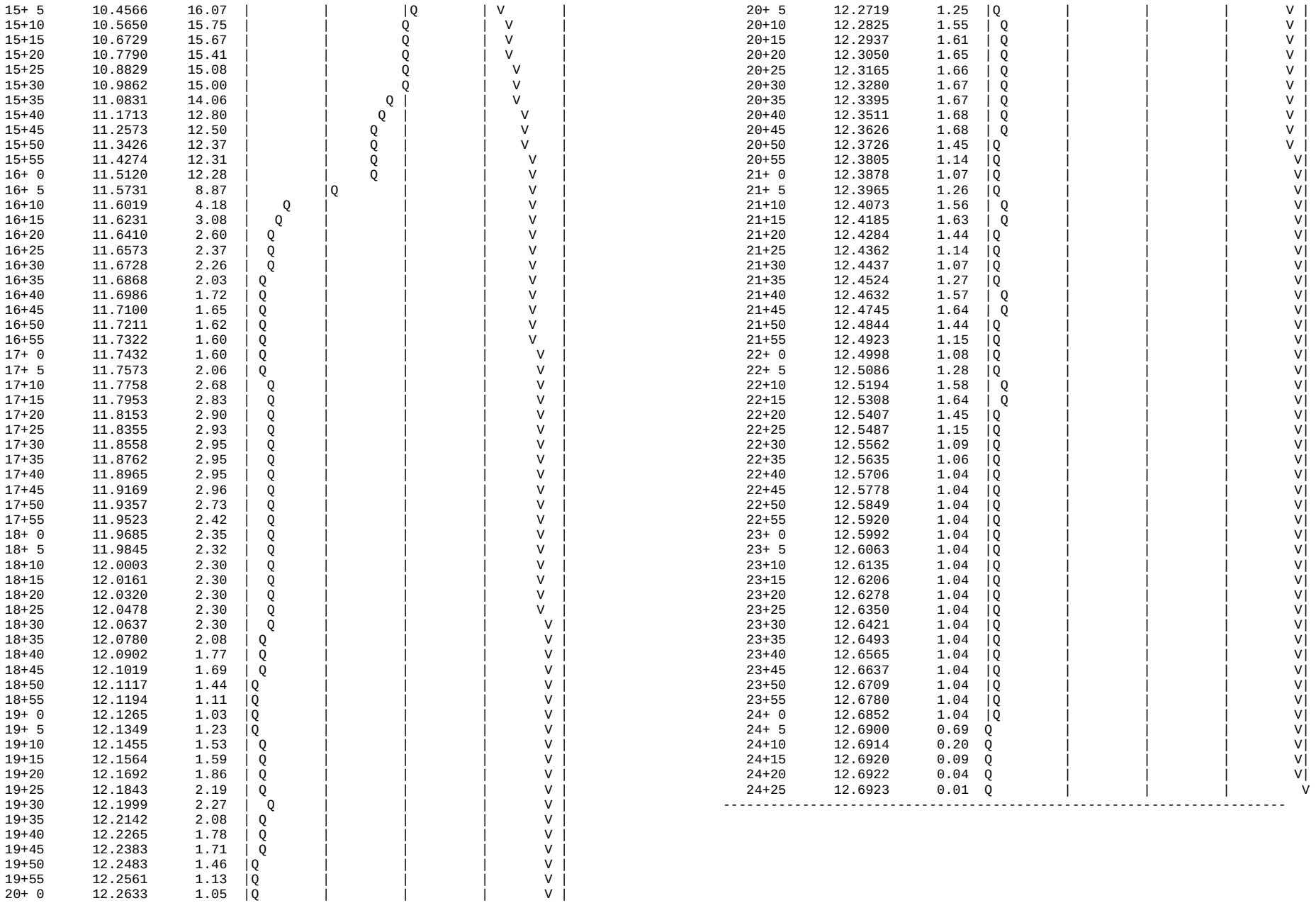

5+ 5	0.9160	4.06	V Q			
5+10	0.9397	3.45	V Q			
5+15	0.9626	3.31	VQ			
5+20	0.9865	3.48	VQ			
5+25	1.0125	3.77	V Q			
5+30	1.0388	3.83	V Q			
5+35	1.0670	4.09	V Q			
5+40	1.0975	4.42	V Q			
5+45	1.1285	4.51	V Q			
5+50	1.1598	4.54	V Q			
5+55	1.1912	4.56	V Q			
6+ 0	1.2227	4.57	V Q			
6+ 5	1.2558	4.80	V Q			
6+10	1.2911	5.12	V Q			
6+15	1.3269	5.20	V Q			
6+20	1.3629	5.23	V Q			
6+25	1.3991	5.25	V Q			
6+30	1.4354	5.26	V Q			
6+35	1.4732	5.49	V Q			
6+40	1.5132	5.81	V Q			
6+45	1.5538	5.89	V Q			
6+50	1.5946	5.92	V Q			
6+55	1.6355	5.94	V Q			
7+ 0	1.6765	5.95	V Q			
7+ 5	1.7175	5.96	V Q			
7+10	1.7586	5.96	V Q			
7+15	1.7997	5.96	V Q			
7+20	1.8423	6.19	V Q			
7+25	1.8872	6.51	V Q			
7+30	1.9325	6.59	V Q			
7+35	1.9797	6.85	V Q			
7+40	2.0292	7.18	V Q			
7+45	2.0792	7.27	V Q			
7+50	2.1311	7.53	V Q			
7+55	2.1853	7.86	V Q			
8+ 0	2.2400	7.95	V Q			
8+ 5	2.2981	8.44	V Q			
8+10	2.3606	9.08	V Q			
8+15	2.4243	9.24	V Q			
8+20	2.4884	9.31	V Q			
8+25	2.5527	9.34	V Q			
8+30	2.6172	9.36	V Q			
8+35	2.6832	9.59	V Q			
8+40	2.7515	9.91	V Q			
8+45	2.8202	9.98	V Q			
8+50	2.8908	10.25	V Q			
8+55	2.9637	10.58	V Q			
9+ 0	3.0371	10.66	V Q			
9+ 5	3.1139	11.15	V Q			
9+10	3.1952	11.80	V Q			
9+15	3.2775	11.96	V Q			
9+20	3.3619	12.25	V Q			
9+25	3.4486	12.60	V Q			
9+30	3.5360	12.69	V Q			
9+35	3.6252	12.95	V Q			
9+40	3.7167	13.28	V Q			
9+45	3.8088	13.37	V Q			
9+50	3.9027	13.63	V Q			
9+55	3.9989	13.96	V Q			
10+ 0	4.0956	14.05	V Q			

10+ 5	4.1816	12.49		V Q		
10+10	4.2527	10.32		Q		
10+15	4.3202	9.81		Q		
10+20	4.3863	9.59		QV		
10+25	4.4516	9.48		Q V		
10+30	4.5166	9.43		Q V		
10+35	4.5894	10.58		Q		
10+40	4.6731	12.14		V Q		
10+45	4.7592	12.51		V Q		
10+50	4.8465	12.68		VQ		
10+55	4.9344	12.76		V Q		
11+ 0	5.0226	12.80		V Q		
11+ 5	5.1092	12.57		Q		
11+10	5.1936	12.26		Q		
11+15	5.2776	12.19		Q		
11+20	5.3614	12.16		Q		
11+25	5.4451	12.15		QV		
11+30	5.5287	12.15		QV		
11+35	5.6093	11.69		Q V		
11+40	5.6855	11.07		Q V		
11+45	5.7608	10.93		Q V		
11+50	5.8372	11.09		Q V		
11+55	5.9156	11.38		Q V		
12+ 0	5.9943	11.44		Q V		
12+ 5	6.0843	13.07		Q V		
12+10	6.1895	15.28		VQ		
12+15	6.2984	15.80		V Q		
12+20	6.4103	16.26		VQ		
12+25	6.5252	16.68		V Q		
12+30	6.6410	16.81		V Q		
12+35	6.7602	17.30		V Q		
12+40	6.8838	17.95		V Q		
12+45	7.0084	18.10		V Q		
12+50	7.1352	18.40		V Q		
12+55	7.2643	18.75		V Q		
13+ 0	7.3940	18.84		V Q		
13+ 5	7.5318	20.01		V Q		
13+10	7.6805	21.59		V Q		
13+15	7.8318	21.97		V Q		
13+20	7.9842	22.13		V Q		
13+25	8.1372	22.21		V Q		
13+30	8.2905	22.25		V Q		
13+35	8.4265	19.75		Q		
13+40	8.5389	16.31		Q V		
13+45	8.6457	15.51		Q V		
13+50	8.7501	15.16		Q V		
13+55	8.8533	14.99		Q V		
14+ 0	8.9559	14.91		Q V		
14+ 5	9.0649	15.82		Q V		
14+10	9.1825	17.07		Q V		
14+15	9.3021	17.37		Q V		
14+20	9.4210	17.27		Q V		
14+25	9.5383	17.03		Q V		
14+30	9.6553	16.98		Q V		
14+35	9.7720	16.95		Q V		
14+40	9.8887	16.94		Q V		
14+45	10.0054	16.94		Q V		
14+50	10.1205	16.71		Q V		
14+55	10.2334	16.40		Q V		
15+ 0	10.3459	16.33		Q V		



SECTION 6
HYDROGRAPH ANALYSIS
BASIN B

BASIN STAGE VS STORAGE CALCULATIONS

Basin B Stage /Storage

Elev	Diff (Ft)	Stage (Ft)	Area (SF)	Average Area (SF)	Incrimental Volume (CF)	Total Volume (CF)	Total Volume (Ac-ft)	
1462.00	0	0	18291.4	0.0	0.0	0	0	
1462.50	0.50	0.50	19969.7	19130.6	9565.3	9565.28	0.220	
1463.00	0.50	1.00	23342.5	21656.1	10828.1	20393.33	0.468	
1463.50	0.50	1.50	30340.1	26841.3	13420.7	33813.98	0.776	
1464.00	0.50	2.00	37049.4	33694.8	16847.4	50661.35	1.163	
1464.50	0.50	2.50	39045.0	38047.2	19023.6	69684.95	1.600	
1465.00	0.50	3.00	41059.1	40052.1	20026.0	89710.98	2.059	
1465.50	0.50	3.50	43093.3	42076.2	21038.1	110749.08	2.542	
1466.00	0.50	4.00	45146.1	44119.7	22059.9	132808.93	3.049	Hydromod Volume
1466.50	0.50	4.50	47218.9	46182.5	23091.3	155900.18	3.579	3.2 AC-FT @ 4.2 ft
1467.00	0.50	5.00	49310.2	48264.6	24132.3	180032.45	4.133	
1467.50	0.50	5.50	51421.6	50365.9	25183.0	205215.40	4.711	
1468.00	0.50	6.00	53551.6	52486.6	26243.3	231458.70	5.314	
1468.50	0.50	6.50	55701.6	54626.6	27313.3	258772.00	5.941	
1469.00	0.50	7.00	57870.2	56785.9	28393.0	287164.95	6.592	
1469.50	0.50	7.50	60058.8	58964.5	29482.3	316647.20	7.269	Spillway Crest
1470.00	0.50	8.00	62266.9	61162.9	30581.4	347228.63	7.971	
1470.50	0.50	8.50	64497.6	63382.3	31691.1	378919.75	8.699	
1471.00	0.50	9.00	66749.0	65623.3	32811.7	411731.40	9.452	Top of Basin

EXHIBIT 1 – 100-YEAR, 24HR PROPOSED CONDITION HYDROGRAPH

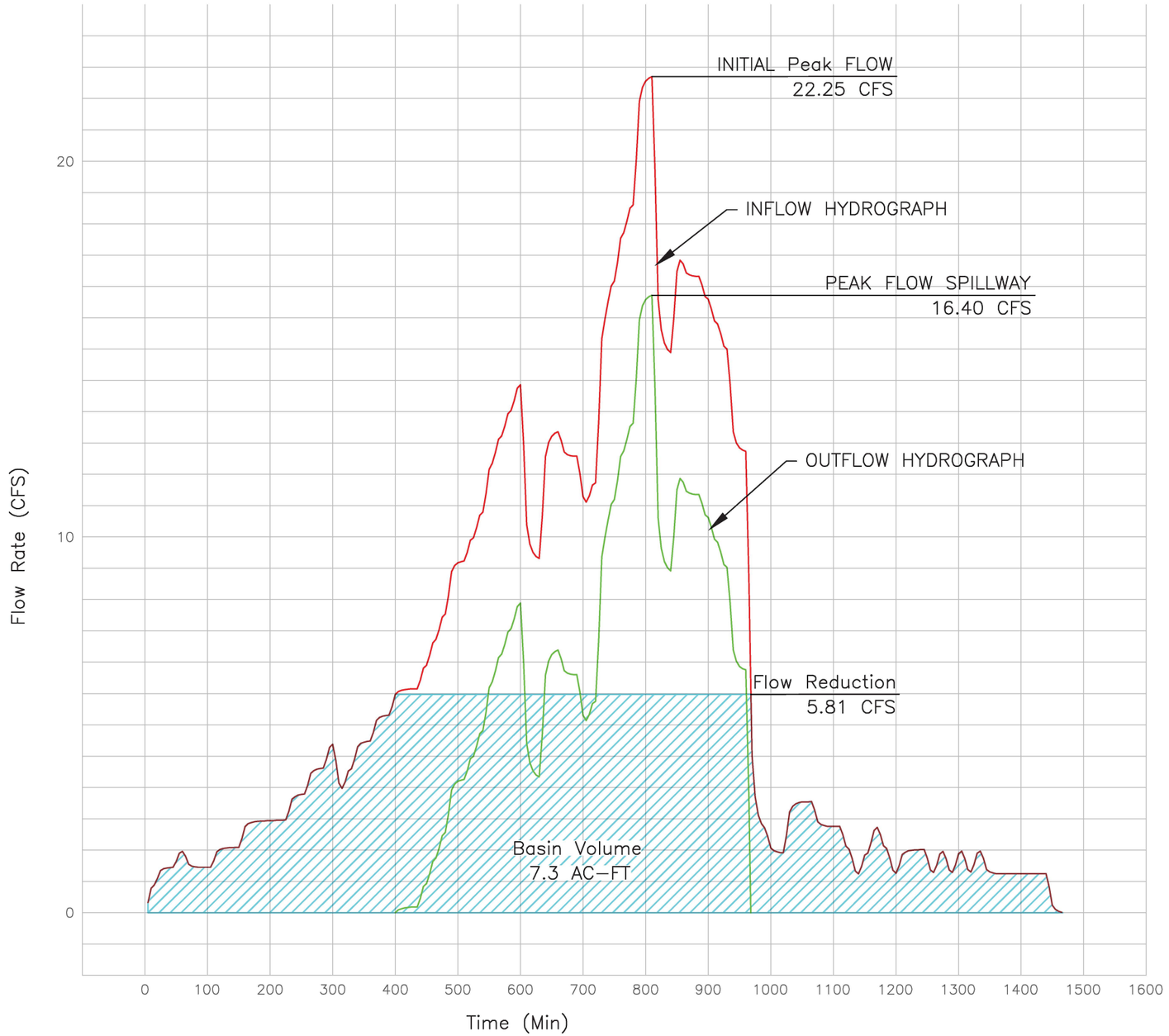


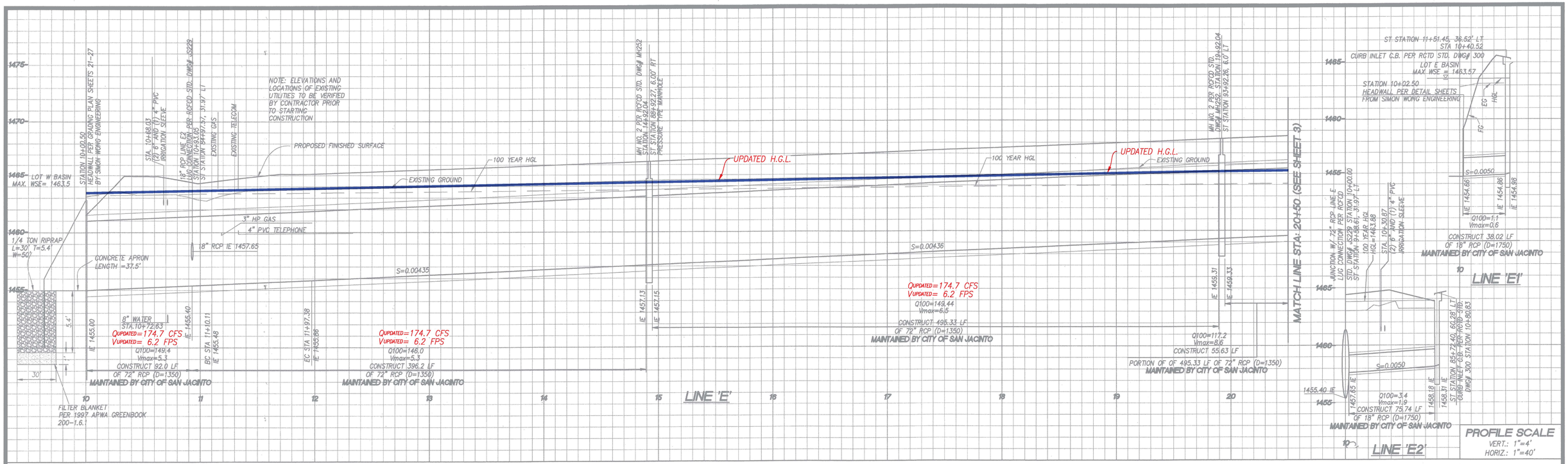
EXHIBIT 1

AREA B (Basin B) PROPOSED CONDITION

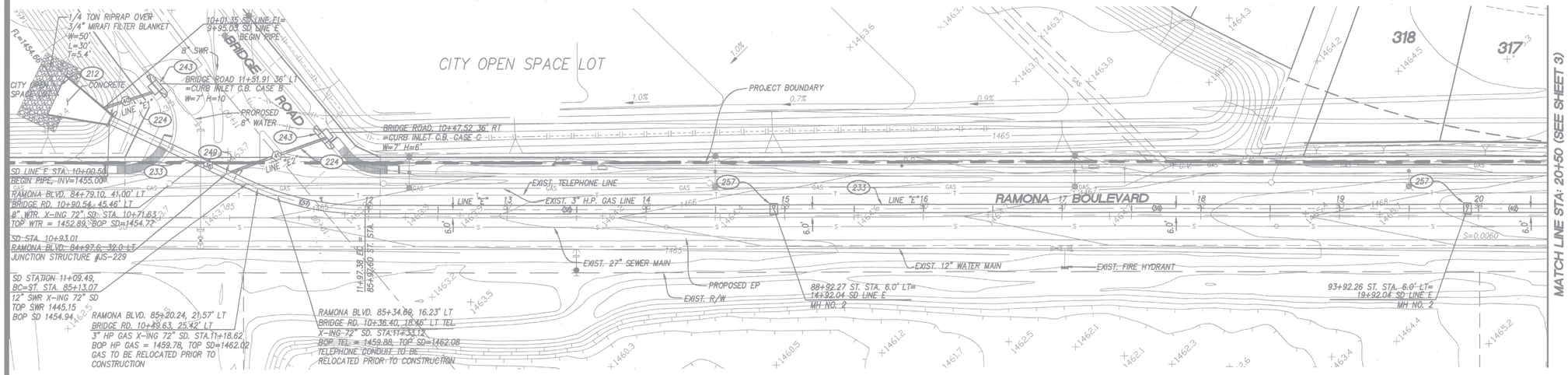
100-YEAR, 24-HR HYDROGRAPH

SECTION 7
WSPG MODEL LINE E

UPDATED RECORD DRAWING FOR LINE E



SEE STORM DRAIN AND GRADING PLANS FOR TRACT 31886 FOR ON-SITE INFORMATION
CITY FILE # SJ-169



STORM DRAIN DATA				
NO.	DELTA OR BRG.	RADIUS(ft)	LENGTH(ft)	TANGENT(ft)
36	N19°55'35"W	------	110.11	------
37	25°00'00"	200.00	87.27	44.34
38	N44°55'35"W	------	291.92	------
39	N44°55'35"W	------	494.50	------
40	N62°56'18"W	------	37.36	------
41	N64°55'35"W	------	77.17	------
42	N44°55'35"W	------	494.50	------

CONSTRUCTION NOTES

(212) INSTALL 1/4 TON RIPRAP OVER 3/4" MIRAFI FILTER BLANKET
(224) INSTALL 18" (D-1750) RCP STORM DRAIN PIPE
(233) INSTALL 72" (D-1350) RCP STORM DRAIN PIPE
(243) INSTALL CURB INLET CATCH BASIN PER R.C.T.D. STD. DWG #300 – 300A (W= OPENING; H= DEPTH TO PIPE INVERT)
(249) INSTALL JUNCTION STRUCTURE NO. 4 PER R.C.F.C.D. STD. DWG #JS229
(257) INSTALL STORM DRAIN MANHOLE NO. 2 PER R.C.F.C.D. STD. DWG #MH252

0 20 40 80 120 160
GRAPHICAL SCALE

PROFILE SCALE
VERT.: 1"=4'
HORIZ.: 1"=40'

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REV.	DATE	DESCRIPTION	DATE	APPROVAL

BENCHMARK:
RIVERSIDE COUNTY B.M. H-14-4 IN THE INTERSECTION OF POTTER ROAD AND RAMONA BOULEVARD A 1" IRON PIPE IN A CAP WELL MONUMENT AND MARKED COUNTY SURVEYOR. ELEVATION: 1487.542 NGVD 1929

SEAL
REGISTERED PROFESSIONAL ENGINEER GARY W. WESCH No. 27376 EXP. 03-31-07 CIVIL STATE OF CALIFORNIA

SUBMITTED BY:
11/16/06 DATE
Gary W. Wesch
REGISTERED CIVIL ENGINEER NO. 27376
REGISTRATION EXPIRES ON 3-31-07

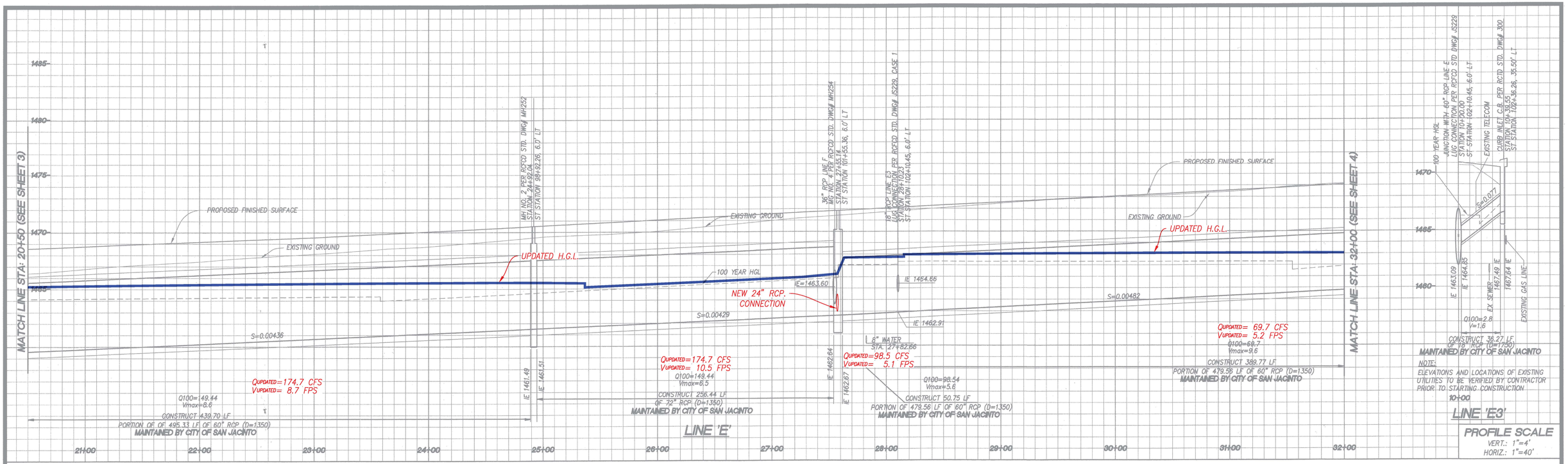
APPROVED BY:
DATE
CITY ENGINEER-CITY OF SAN JACINTO
HABIB MOTLAGH

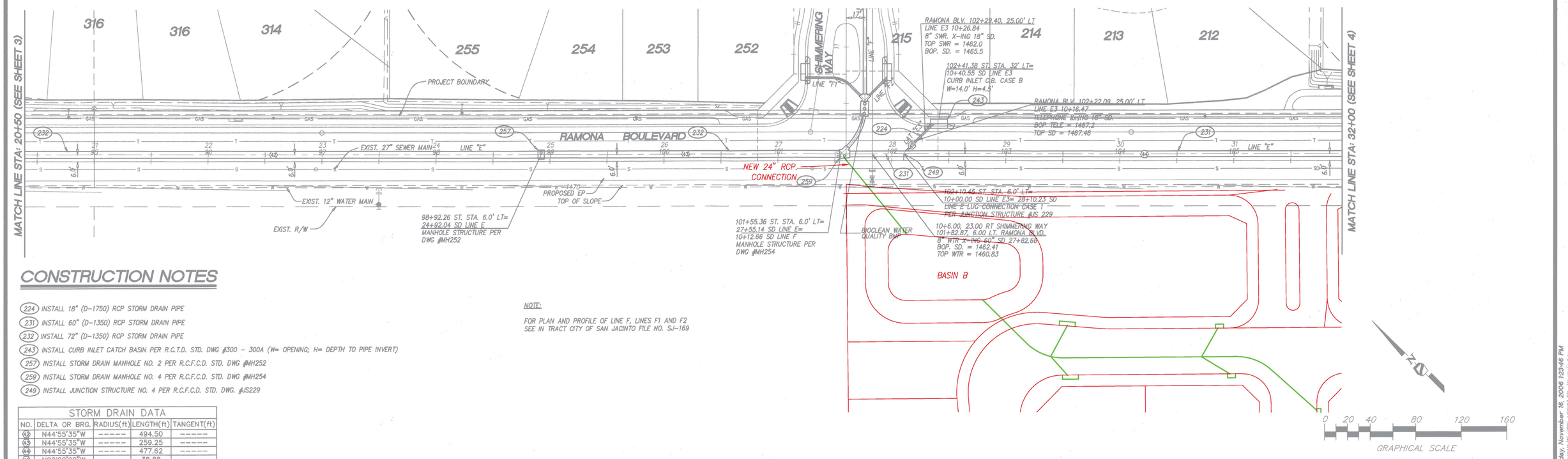
PLANS PREPARED BY:
PROJECT DESIGN CONSULTANTS
Planning | Landscape Architecture | Environmental | Engineering | Survey
43460 Ridge Park Drive, Suite 170, Temecula, CA 92590
951.695.5596 Tel 951.695.5597 Fax

CITY OF SAN JACINTO
TRACT NO. 31886
PUBLIC STORM DRAIN IMPROVEMENT PLANS FOR RAMONA BOULEVARD
LINE: 'E' (STA. 10 TO 20+50), 'E1', 'E2'

2 OF 4 SHEETS
CITY FILE NO.

DATE AND TIME PRINTED: Wednesday, November 15, 2006 2:34:42 PM





CONSTRUCTION NOTES

(224) INSTALL 18" (D-1750) RCP STORM DRAIN PIPE
(231) INSTALL 60" (D-1350) RCP STORM DRAIN PIPE
(232) INSTALL 72" (D-1350) RCP STORM DRAIN PIPE
(243) INSTALL CURB INLET CATCH BASIN PER R.C.T.D. STD. DWG #300 – 300A (W= OPENING; H= DEPTH TO PIPE INVERT)
(257) INSTALL STORM DRAIN MANHOLE NO. 2 PER R.C.F.C.D. STD. DWG #MH252
(259) INSTALL STORM DRAIN MANHOLE NO. 4 PER R.C.F.C.D. STD. DWG #MH254
(249) INSTALL JUNCTION STRUCTURE NO. 4 PER R.C.F.C.D. STD. DWG. #JS229

STORM DRAIN DATA				
NO.	DELTA OR BRG.	RADIUS(ft)	LENGTH(ft)	TANGENT(ft)
(42)	N44°55'35"W	------	494.50	------
(43)	N44°55'35"W	------	259.25	------
(44)	N44°55'35"W	------	477.62	------
(45)	N90°00'00"W	------	38.88	------

NOTE:

FOR PLAN AND PROFILE OF LINE F, LINES F1 AND F2 SEE IN TRACT CITY OF SAN JACINTO FILE NO. SJ-169

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REV.	DATE	DESCRIPTION	DATE	APPROVAL

BENCHMARK:

RIVERSIDE COUNTY B.M. H-14-4
IN THE INTERSECTION OF POTTER ROAD AND RAMONA BOULEVARD A 1" IRON PIPE IN A CAP. WELL MONUMENT AND MARKED COUNTY SURVEYOR. ELEVATION: 1487.542 NGVD 1929

SEAL
REGISTERED PROFESSIONAL ENGINEER
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No. 27376
EXP. 03-31-07
CIVIL
STATE OF CALIFORNIA

SUBMITTED BY:
11/16/06 DATE
Gary W Wesch
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REGISTRATION EXPIRES ON 3-31-07

APPROVED BY:
DATE
CITY ENGINEER-CITY OF SAN JACINTO
HABIB MOTLAGH

PLANS PREPARED BY:
PROJECT DESIGN CONSULTANTS
Planning | Landscape Architecture | Environmental | Engineering | Survey
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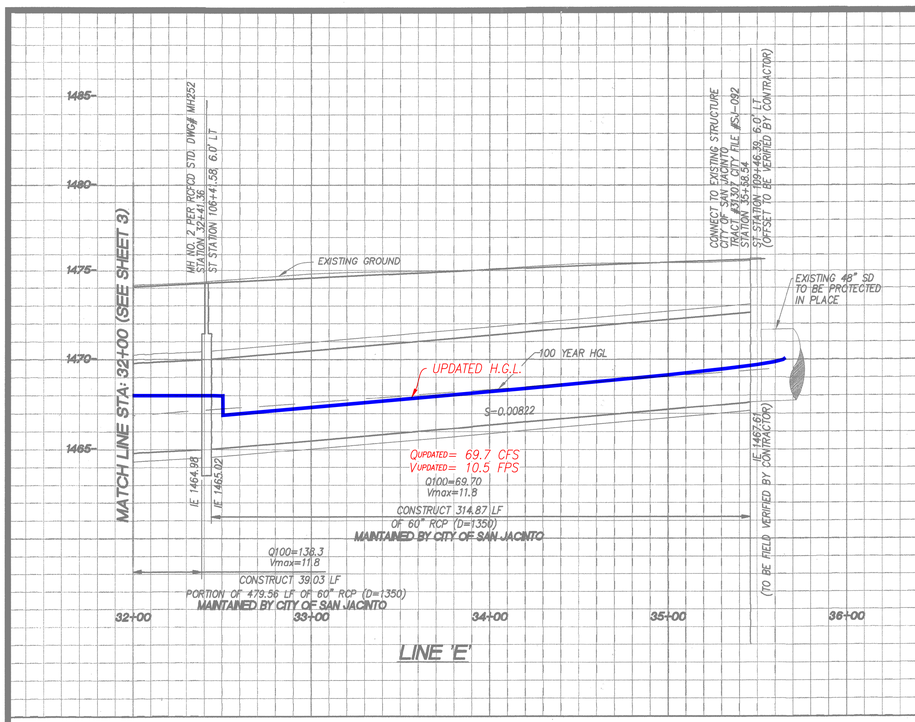
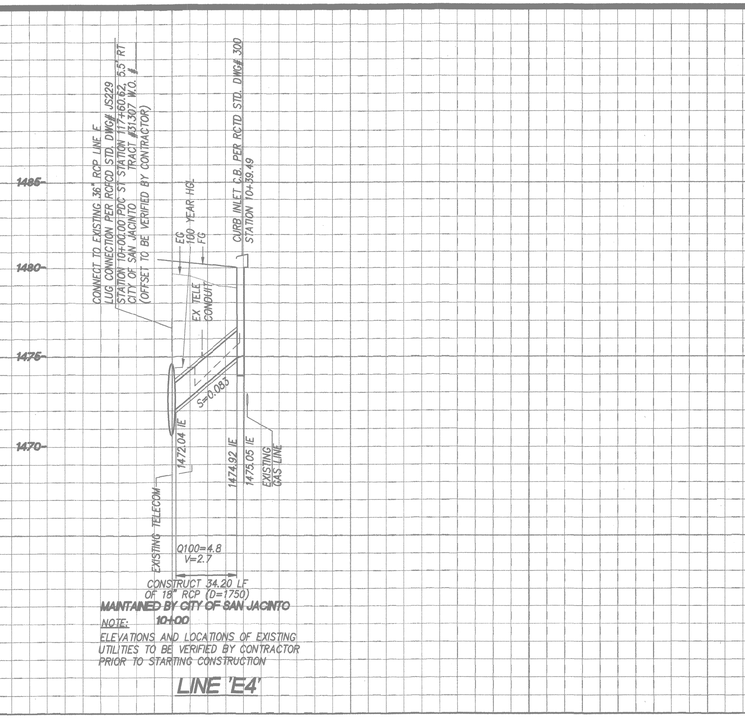
951.695.5596 Tel 951.695.5597 Fax

CITY OF SAN JACINTO
TRACT NO. 31886
PUBLIC STORM DRAIN IMPROVEMENT PLANS FOR RAMONA BOULEVARD
LINE: 'E' (STA. 20+50 TO 32+00), 'E3'

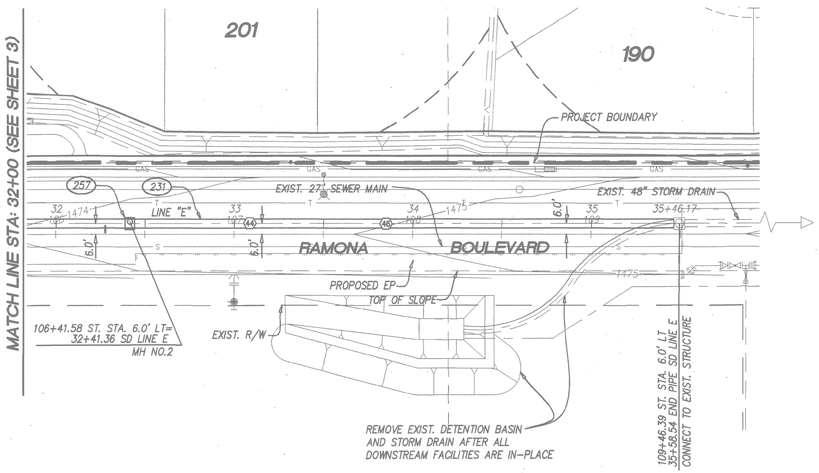
3
OF 4 SHEETS
CITY FILE NO.

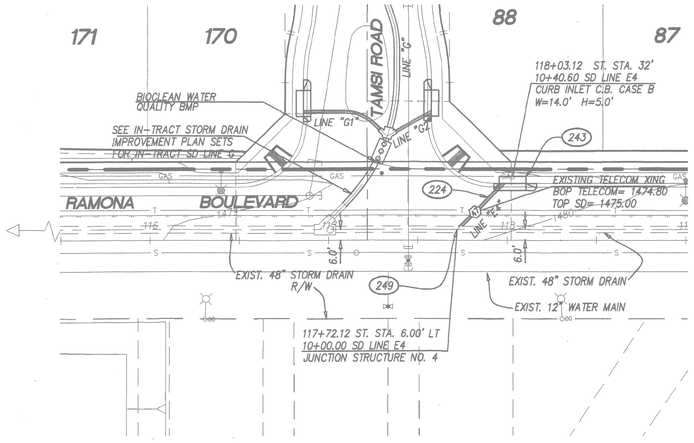
DATE AND TIME PRINTED: Thursday, November 16, 2006 12:46 PM



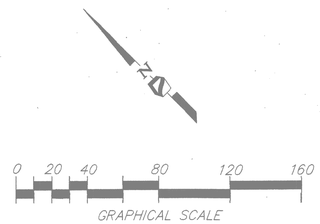


PROFILE SCALE
VERT.: 1"=4'
HORIZ.: 1"=40'





STORM DRAIN DATA				
NO.	DELTA OR BRG.	RADIUS(ft)	LENGTH(ft)	TANGENT(ft)
(44)	N44°55'35"W	------	475.62	------
(46)	N44°55'35"W	------	302.06	------
(47)	N89°55'35"W	------	36.77	------



CONSTRUCTION NOTES

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(231) INSTALL 60" (D-1350) RCP STORM DRAIN PIPE
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(257) INSTALL STORM DRAIN MANHOLE NO. 2 PER R.C.F.C.D. STD. DWG #MH252

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REV.	DATE	DESCRIPTION	DATE	APPROVAL

BENCHMARK:
RIVERSIDE COUNTY B.M. H-14-4
IN THE INTERSECTION OF
POTTER ROAD AND RAMONA
BOULEVARD A 1" IRON PIPE IN
A CAP WELL MONUMENT AND
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ELEVATION: 1487.542 NGVD
1929

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CIVIL
STATE OF CALIFORNIA

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1/11/07 DATE
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FOR RAMONA BOULEVARD
LINE: 'E' (STA. 32+00 TO 35+60), 'E4'

4
OF 4 SHEETS
CITY FILE NO.
SJ-169

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WSPG MODEL RESULTS

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  CARD  SECT  CHN   NO OF  AVE PIER  HEIGHT 1  BASE    ZL    ZR   INV   Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
  CODE   NO   TYPE PIER/PIP WIDTH    DIAMETER  WIDTH             DROP

  CD      1    4      1             1.500
  CD      2    4      1             3.000
  CD      3    4      1             4.000
  CD      4    4      1             5.000
  CD      5    4      1             6.000
  CD      7    4      1             2.000
                                              W S P G W                                                 PAGE NO   1
                              WATER SURFACE PROFILE - TITLE CARD LISTING
 HEADING LINE NO 1 IS -
                                HYDRAULICS FOR STORM DRAIN ALONG RAMONA BLVD
 HEADING LINE NO 2 IS -
                                EX. 60" PIPE FOR 100-YEAR STORM
 HEADING LINE NO 3 IS -
                                ADDITIONAL FLOWS FROM TRACT 38066
                                              W S P G W                                                 PAGE NO   2
                              WATER SURFACE PROFILE - ELEMENT CARD LISTING
  ELEMENT NO   1 IS A SYSTEM OUTLET     *         *     *
                       U/S DATA   STATION    INVERT  SECT                                    W S ELEV
                                  1000.000 1455.000    5                                     1463.500
  ELEMENT NO   2 IS A REACH              *         *     *
                       U/S DATA   STATION    INVERT  SECT              N                         RADIUS    ANGLE     ANG PT  MAN H
                                  1093.050 1455.400    5             .013                          .000     .000      .000     0
  ELEMENT NO   3 IS A JUNCTION           *         *     *     *               *                   *                 *
                       U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                                  1093.051 1455.401    5     1     0   .013      .001      .000  1457.000      .000  45.000     .000
                                                                                                  RADIUS    ANGLE
                                                                                                    .000    .000
  ELEMENT NO   4 IS A REACH              *         *     *
                       U/S DATA   STATION    INVERT  SECT              N                         RADIUS    ANGLE     ANG PT  MAN H
                                  1489.710 1457.130    5             .013                          .000     .000      .000     0
  ELEMENT NO   5 IS A JUNCTION           *         *     *     *               *                   *                 *
                       U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                                  1494.370 1457.150    5     0     0   .013      .000      .000      .000      .000    .000     .000
                                                                                                  RADIUS    ANGLE
                                                                                                    .000    .000
  ELEMENT NO   6 IS A REACH              *         *     *
                       U/S DATA   STATION    INVERT  SECT              N                         RADIUS    ANGLE     ANG PT  MAN H
                                  1989.710 1459.310    5             .013                          .000     .000      .000     0
  ELEMENT NO   7 IS A JUNCTION           *         *     *     *               *                   *                 *
                       U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                                  1994.370 1459.330    5     0     0   .013      .000      .000      .000      .000    .000     .000
                                                                                                  RADIUS    ANGLE
                                                                                                    .000    .000
  ELEMENT NO   8 IS A REACH              *         *     *
                       U/S DATA   STATION    INVERT  SECT              N                         RADIUS    ANGLE     ANG PT  MAN H
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                          2489.710 1461.490    5               .013                        .000     .000      .000     0
                                                  W S P G W                                                    PAGE NO   3
                                WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO   9 IS A JUNCTION            *         *     *     *              *                  *              *
                   U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                              2494.370 1461.510    5     0     0   .013      .000      .000      .000      .000    .000     .000
                                                                                                RADIUS    ANGLE
                                                                                                  .000    .000
ELEMENT NO  10 IS A REACH             *         *     *
                   U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                              2752.140 1462.640    5               .013                          .000     .000      .000     0
ELEMENT NO  11 IS A JUNCTION          *         *     *     *              *                  *              *
                   U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                              2758.140 1462.670    4     2     7   .013    50.900    25.300  1463.600  1462.900  45.000  -51.000
                                                                                                RADIUS    ANGLE
                                                                                                  .000    .000
ELEMENT NO  12 IS A REACH             *         *     *
                   U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                              2810.230 1462.910    4               .013                          .000     .000      .000     0
ELEMENT NO  13 IS A JUNCTION          *         *     *     *              *                  *              *
                   U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                              2810.231 1462.911    4     1     0   .013    28.800      .000  1464.660      .000  45.000     .000
                                                                                                RADIUS    ANGLE
                                                                                                  .000    .000
ELEMENT NO  14 IS A REACH             *         *     *
                   U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                              3239.030 1464.980    4               .013                          .000     .000      .000     0
ELEMENT NO  15 IS A JUNCTION          *         *     *     *              *                  *              *
                   U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                              3243.690 1465.020    4     0     0   .013      .000      .000      .000      .000    .000     .000
                                                                                                RADIUS    ANGLE
                                                                                                  .000    .000
                                                  W S P G W                                                    PAGE NO   4
                                WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO  16 IS A REACH             *         *     *
                   U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                              3558.780 1467.610    4               .013                          .000     .000      .000     0
ELEMENT NO  17 IS A SYSTEM HEADWORKS                  *                    *
                   U/S DATA   STATION    INVERT  SECT                          W S ELEV
                              3558.780 1467.610    4                        1467.610
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Program Package Serial Number: 7181

WATER SURFACE PROFILE LISTING Date: 5-10-2023 Time:10: 8:34

HYDRAULICS FOR STORM DRAIN ALONG RAMONA BLVD
EX. 60" PIPE FOR 100-YEAR STORM
ADDITIONAL FLOWS FROM TRACT 38066

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	1455.000	8.500	1463.500	174.70	6.18	.59	1464.09	.00	3.60	.00	6.000	.000	.00	1 .0
93.050	.0043					.0017	.16	8.50	.00	3.45	.013	.00	.00	PIPE
JUNCT STR	1.0000					.0017	.00	8.26	.00		.013	.00	.00	PIPE
1093.051	1455.401	8.257	1463.658	174.70	6.18	.59	1464.25	.00	3.60	.00	6.000	.000	.00	1 .0
396.659	.0044					.0017	.67	8.26	.00	3.44	.013	.00	.00	PIPE
1489.710	1457.130	7.203	1464.333	174.70	6.18	.59	1464.93	.00	3.60	.00	6.000	.000	.00	1 .0
JUNCT STR	.0043					.0017	.01	7.20	.00		.013	.00	.00	PIPE
1494.370	1457.150	7.191	1464.341	174.70	6.18	.59	1464.93	.00	3.60	.00	6.000	.000	.00	1 .0
447.969	.0044					.0017	.76	7.19	.00	3.44	.013	.00	.00	PIPE
1942.339	1459.104	6.000	1465.104	174.70	6.18	.59	1465.70	.00	3.60	.00	6.000	.000	.00	1 .0
47.371	.0044					.0016	.08	6.00	.00	3.44	.013	.00	.00	PIPE
1989.710	1459.310	5.861	1465.171	174.70	6.22	.60	1465.77	.00	3.60	1.80	6.000	.000	.00	1 .0
JUNCT STR	.0043					.0015	.01	5.86	.28		.013	.00	.00	PIPE
1994.370	1459.330	5.847	1465.177	174.70	6.22	.60	1465.78	.00	3.60	1.89	6.000	.000	.00	1 .0
138.271	.0044					.0015	.21	5.85	.28	3.44	.013	.00	.00	PIPE
2132.641	1459.933	5.392	1465.325	174.70	6.53	.66	1465.99	.00	3.60	3.62	6.000	.000	.00	1 .0
87.742	.0044					.0016	.14	5.39	.42	3.44	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 5-10-2023 Time:10: 8:34

HYDRAULICS FOR STORM DRAIN ALONG RAMONA BLVD
EX. 60" PIPE FOR 100-YEAR STORM
ADDITIONAL FLOWS FROM TRACT 38066

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS) / SF Ave	Vel Head / HF	Energy Grd.El. / SE Dpth	Super Elev / Froude N	Critical Depth / Norm Dp	Flow Top Width / "N"	Height/Dia.-FT / X-Fall	Base Wt or I.D. / ZR	ZL	No Wth Prs/Pip / Type Ch
2220.383	1460.315	5.080	1465.395	174.70	6.84	.73	1466.12	.00	3.60	4.32	6.000	.000	.00	1 .0
70.379	.0044				.0017	.12	5.08	.50	3.44	.013		.00	.00	PIPE
2290.762	1460.622	4.819	1465.441	174.70	7.18	.80	1466.24	.00	3.60	4.77	6.000	.000	.00	1 .0
59.871	.0044				.0019	.11	4.82	.56	3.44	.013		.00	.00	PIPE
2350.634	1460.883	4.589	1465.473	174.70	7.53	.88	1466.35	.00	3.60	5.09	6.000	.000	.00	1 .0
52.000	.0044				.0021	.11	4.59	.62	3.44	.013		.00	.00	PIPE
2402.634	1461.110	4.382	1465.492	174.70	7.90	.97	1466.46	.00	3.60	5.33	6.000	.000	.00	1 .0
45.492	.0044				.0023	.11	4.38	.68	3.44	.013		.00	.00	PIPE
2448.126	1461.309	4.192	1465.501	174.70	8.28	1.06	1466.57	.00	3.60	5.51	6.000	.000	.00	1 .0
39.240	.0044				.0026	.10	4.19	.75	3.44	.013		.00	.00	PIPE
2487.366	1461.480	4.016	1465.496	174.70	8.68	1.17	1466.67	.00	3.60	5.65	6.000	.000	.00	1 .0
2.344	.0044				.0027	.01	4.02	.81	3.44	.013		.00	.00	PIPE
2489.710	1461.490	4.005	1465.495	174.70	8.71	1.18	1466.67	.00	3.60	5.65	6.000	.000	.00	1 .0
JUNCT STR	.0043				.0028	.01	4.01	.82		.013		.00	.00	PIPE
2494.370	1461.510	3.984	1465.494	174.70	8.76	1.19	1466.69	.00	3.60	5.67	6.000	.000	.00	1 .0
30.480	.0044				.0030	.09	3.98	.82	3.43	.013		.00	.00	PIPE
2524.850	1461.644	3.822	1465.465	174.70	9.19	1.31	1466.78	.00	3.60	5.77	6.000	.000	.00	1 .0
7.306	.0044				.0032	.02	3.82	.89	3.43	.013		.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 5-10-2023 Time:10: 8:34

HYDRAULICS FOR STORM DRAIN ALONG RAMONA BLVD
EX. 60" PIPE FOR 100-YEAR STORM
ADDITIONAL FLOWS FROM TRACT 38066

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2532.156	1461.676	3.781	1465.456	174.70	9.31	1.35	1466.80	.00	3.60	5.79	6.000	.000	.00	1 .0
HYDRAULIC JUMP														
2532.156	1461.676	3.430	1465.105	174.70	10.46	1.70	1466.80	.00	3.60	5.94	6.000	.000	.00	1 .0
94.926	.0044					.0044	.42	3.43	1.10	3.43	.013	.00	.00	PIPE
2627.081	1462.092	3.430	1465.522	174.70	10.46	1.70	1467.22	.00	3.60	5.94	6.000	.000	.00	1 .0
94.752	.0044					.0043	.41	3.43	1.10	3.43	.013	.00	.00	PIPE
2721.833	1462.507	3.461	1465.969	174.70	10.34	1.66	1467.63	.00	3.60	5.93	6.000	.000	.00	1 .0
30.307	.0044					.0040	.12	3.46	1.08	3.43	.013	.00	.00	PIPE
2752.140	1462.640	3.602	1466.242	174.70	9.86	1.51	1467.75	.00	3.60	5.88	6.000	.000	.00	1 .0
JUNCT STR	.0050					.0026	.02	3.60	1.00		.013	.00	.00	PIPE
2758.140	1462.670	4.984	1467.654	98.50	5.02	.39	1468.05	.00	2.82	.56	5.000	.000	.00	1 .0
52.090	.0046					.0013	.07	4.98	.15	2.67	.013	.00	.00	PIPE
2810.230	1462.910	4.802	1467.712	98.50	5.08	.40	1468.11	.00	2.82	1.95	5.000	.000	.00	1 .0
JUNCT STR	1.0000					.0010	.00	4.80	.28		.013	.00	.00	PIPE
2810.231	1462.911	5.007	1467.918	69.70	3.55	.20	1468.11	.00	2.36	.00	5.000	.000	.00	1 .0
1.728	.0048					.0007	.00	5.01	.00	2.15	.013	.00	.00	PIPE
2811.958	1462.919	5.000	1467.919	69.70	3.55	.20	1468.11	.00	2.36	.00	5.000	.000	.00	1 .0
106.502	.0048					.0007	.07	5.00	.00	2.15	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 5-10-2023 Time:10: 8:34

HYDRAULICS FOR STORM DRAIN ALONG RAMONA BLVD
EX. 60" PIPE FOR 100-YEAR STORM
ADDITIONAL FLOWS FROM TRACT 38066

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2918.460	1463.433	4.537	1467.970	69.70	3.72	.22	1468.19	.00	2.36	2.90	5.000	.000	.00	1 .0
59.327	.0048					.0006	.04	4.54	.26	2.15	.013	.00	.00	PIPE
2977.787	1463.719	4.267	1467.987	69.70	3.90	.24	1468.22	.00	2.36	3.54	5.000	.000	.00	1 .0
48.101	.0048					.0007	.03	4.27	.31	2.15	.013	.00	.00	PIPE
3025.889	1463.952	4.045	1467.997	69.70	4.10	.26	1468.26	.00	2.36	3.93	5.000	.000	.00	1 .0
41.542	.0048					.0008	.03	4.05	.35	2.15	.013	.00	.00	PIPE
3067.431	1464.152	3.851	1468.003	69.70	4.30	.29	1468.29	.00	2.36	4.21	5.000	.000	.00	1 .0
36.909	.0048					.0009	.03	3.85	.39	2.15	.013	.00	.00	PIPE
3104.341	1464.330	3.676	1468.006	69.70	4.50	.32	1468.32	.00	2.36	4.41	5.000	.000	.00	1 .0
33.291	.0048					.0010	.03	3.68	.42	2.15	.013	.00	.00	PIPE
3137.632	1464.491	3.516	1468.006	69.70	4.72	.35	1468.35	.00	2.36	4.57	5.000	.000	.00	1 .0
30.249	.0048					.0011	.03	3.52	.46	2.15	.013	.00	.00	PIPE
3167.881	1464.637	3.367	1468.004	69.70	4.96	.38	1468.39	.00	2.36	4.69	5.000	.000	.00	1 .0
27.637	.0048					.0012	.03	3.37	.50	2.15	.013	.00	.00	PIPE
3195.518	1464.770	3.229	1467.999	69.70	5.20	.42	1468.42	.00	2.36	4.78	5.000	.000	.00	1 .0
25.241	.0048					.0014	.03	3.23	.55	2.15	.013	.00	.00	PIPE
3220.760	1464.892	3.100	1467.991	69.70	5.45	.46	1468.45	.00	2.36	4.85	5.000	.000	.00	1 .0
18.270	.0048					.0015	.03	3.10	.59	2.15	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 5-10-2023 Time:10: 8:34

HYDRAULICS FOR STORM DRAIN ALONG RAMONA BLVD
EX. 60" PIPE FOR 100-YEAR STORM
ADDITIONAL FLOWS FROM TRACT 38066

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3239.030	1464.980	3.004	1467.984	69.70	5.66	.50	1468.48	.00	2.36	4.90	5.000	.000	.00	1 .0
JUNCT STR	.0086					.0016	.01	3.00	.63		.013	.00	.00	PIPE
3243.690	1465.020	2.949	1467.969	69.70	5.79	.52	1468.49	.00	2.36	4.92	5.000	.000	.00	1 .0
.437	.0082					.0017	.00	2.95	.65	1.86	.013	.00	.00	PIPE
3244.127	1465.024	2.949	1467.972	69.70	5.79	.52	1468.49	.00	2.36	4.92	5.000	.000	.00	1 .0
HYDRAULIC JUMP														
3244.127	1465.024	1.862	1466.885	69.70	10.46	1.70	1468.59	.00	2.36	4.83	5.000	.000	.00	1 .0
172.071	.0082					.0079	1.37	1.86	1.57	1.86	.013	.00	.00	PIPE
3416.198	1466.438	1.897	1468.335	69.70	10.20	1.62	1469.95	.00	2.36	4.85	5.000	.000	.00	1 .0
76.406	.0082					.0072	.55	1.90	1.52	1.86	.013	.00	.00	PIPE
3492.604	1467.066	1.965	1469.031	69.70	9.73	1.47	1470.50	.00	2.36	4.88	5.000	.000	.00	1 .0
32.592	.0082					.0063	.21	1.97	1.42	1.86	.013	.00	.00	PIPE
3525.197	1467.334	2.037	1469.371	69.70	9.27	1.34	1470.71	.00	2.36	4.91	5.000	.000	.00	1 .0
17.558	.0082					.0055	.10	2.04	1.32	1.86	.013	.00	.00	PIPE
3542.754	1467.478	2.111	1469.589	69.70	8.84	1.21	1470.80	.00	2.36	4.94	5.000	.000	.00	1 .0
9.750	.0082					.0049	.05	2.11	1.23	1.86	.013	.00	.00	PIPE
3552.504	1467.558	2.189	1469.747	69.70	8.43	1.10	1470.85	.00	2.36	4.96	5.000	.000	.00	1 .0
4.858	.0082					.0043	.02	2.19	1.15	1.86	.013	.00	.00	PIPE

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WATER SURFACE PROFILE LISTING Date: 5-10-2023 Time:10: 8:34

HYDRAULICS FOR STORM DRAIN ALONG RAMONA BLVD
EX. 60" PIPE FOR 100-YEAR STORM
ADDITIONAL FLOWS FROM TRACT 38066

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3557.362	1467.598	2.270	1469.868	69.70	8.04	1.00	1470.87	.00	2.36	4.98	5.000	.000	.00	1 .0
1.418	.0082					.0038	.01	2.27	1.07	1.86	.013	.00	.00	PIPE
3558.780	1467.610	2.356	1469.966	69.70	7.66	.91	1470.88	.00	2.36	4.99	5.000	.000	.00	1 .0

SECTION 8
REFERENCES

HYDROLOGIC SOILS GROUP MAP
(NRCS MAP)

Soil Map—Western Riverside Area, California



Map Scale: 1:4,490 if printed on B landscape (17" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 14, Sep 13, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2022—May 28, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DrA	Dello loamy fine sand, gravelly substratum, 0 to 2 percent slopes	15.1	9.0%
GoB	Grangeville loamy fine sand, drained, 0 to 5 percent slopes	0.3	0.2%
GpB	Grangeville sandy loam, drained, saline-alkali, 0 to 5 percent slopes	11.8	7.1%
GsB	Grangeville sandy loam, sandy substratum, drained, saline-alkali , 0 to 5 percent slopes	17.0	10.2%
GuB	Grangeville fine sandy loam, poorly drained, saline-alk ali, 0 to 5 percent slopes	73.3	43.9%
GvB	Grangeville fine sandy loam, saline-alkali, 0 to 5 percent slopes	46.6	27.9%
Tr2	Traver loamy fine sand, saline-alkali, eroded	2.9	1.7%
Totals for Area of Interest		**166.9**	**100.0%**

Western Riverside Area, California

DrA—Dello loamy fine sand, gravelly substratum, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hct4
Elevation: 10 to 20 feet
Mean annual precipitation: 10 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 200 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

Dello and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dello

Setting

Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 8 inches: loamy fine sand
H2 - 8 to 36 inches: sand
H3 - 36 to 60 inches: gravelly coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: R019XD035CA - SANDY (1975)

Hydric soil rating: No

Minor Components

Hanford
Percent of map unit: 5 percent
Hydric soil rating: No

Grangeville
Percent of map unit: 5 percent
Hydric soil rating: No

Tujunga
Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 14, Sep 13, 2021

Western Riverside Area, California

GpB—Grangeville sandy loam, drained, saline-alkali, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: hcvk
Elevation: 10 to 1,800 feet
Mean annual precipitation: 8 to 16 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 200 to 270 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Grangeville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 17 inches: sandy loam
H2 - 17 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D

Ecological site: R019XD070CA - SANDY BASIN
Hydric soil rating: No

Minor Components

Dello
Percent of map unit: 10 percent
Hydric soil rating: No

Traver
Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 14, Sep 13, 2021

Western Riverside Area, California

GsB—Grangeville sandy loam, sandy substratum, drained, saline-alkali , 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: hcvm
Elevation: 10 to 1,800 feet
Mean annual precipitation: 8 to 16 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 200 to 270 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Grangeville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 36 inches: sandy loam
H2 - 36 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D

Ecological site: R019XD070CA - SANDY BASIN
Hydric soil rating: No

Minor Components

Dello
Percent of map unit: 10 percent
Hydric soil rating: No

Traver
Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 14, Sep 13, 2021

Western Riverside Area, California

GuB—Grangeville fine sandy loam, poorly drained, saline-alk ali, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: hcvq
Elevation: 10 to 1,800 feet
Mean annual precipitation: 8 to 16 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 200 to 270 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Grangeville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 17 inches: fine sandy loam
H2 - 17 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: R019XD070CA - SANDY BASIN

Hydric soil rating: No

Minor Components

Dello
Percent of map unit: 5 percent
Hydric soil rating: No

Traver
Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed
Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed
Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 14, Sep 13, 2021

Western Riverside Area, California

GvB—Grangeville fine sandy loam, saline-alkali, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: hcvr
Elevation: 10 to 1,800 feet
Mean annual precipitation: 8 to 16 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 200 to 270 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Grangeville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 17 inches: fine sandy loam
H2 - 17 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: R019XD070CA - SANDY BASIN

Hydric soil rating: No

Minor Components

Dello

Percent of map unit: 10 percent
Hydric soil rating: No

Traver

Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 14, Sep 13, 2021

Western Riverside Area, California

Tr2—Traver loamy fine sand, saline-alkali, eroded

Map Unit Setting

National map unit symbol: hczg
Elevation: 1,000 feet
Mean annual precipitation: 10 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 250 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Traver and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Traver

Setting

Landform: Valley floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 13 inches: loamy fine sand
H2 - 13 to 38 inches: fine sandy loam
H3 - 38 to 60 inches: stratified fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: B
Ecological site: R019XD070CA - SANDY BASIN
Hydric soil rating: No

Minor Components

Dello
Percent of map unit: 5 percent
Hydric soil rating: No

Grangeville
Percent of map unit: 5 percent
Hydric soil rating: No

Waukena
Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 14, Sep 13, 2021

LAND USE/IMPERVIOUSNESS DATA TABLE (PLATE E-6.3)

Existing Condition & Basin Areas

Proposed Lots including streets.

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent(2)
Natural or Agriculture	0 - 10	0
Single Family Residential: (3)		
40,000 S. F. (1 Acre) Lots	10 - 25	20
20,000 S. F. (½ Acre) Lots	30 - 45	40
7,200 - 10,000 S. F. Lots	45 - 55	50
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial	80 -100	90

Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.

2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area should always be made, and a review of aerial photos, where available may assist in estimating the percentage of impervious cover in developed areas.

3. For typical horse ranch subdivisions increase impervious area 5 percent over the values recommended in the table above.

RCFC & WCD
HYDROLOGY MANUAL

IMPERVIOUS COVER FOR DEVELOPED AREAS

PLATE E-6.3

PRECIPITATION
(NOAA ATLAS 14, VOLUME 6, VERSION 2)

NOAA Atlas 14, Volume 6, Version 2
Location name: San Jacinto, California, USA*
Latitude: 33.8123°, Longitude: -116.9967°
Elevation: 1476.62 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.085 (0.071-0.103)	0.116 (0.096-0.140)	0.161 (0.134-0.196)	0.203 (0.168-0.249)	0.269 (0.214-0.341)	0.327 (0.255-0.424)	0.393 (0.299-0.523)	0.470 (0.347-0.644)	0.591 (0.418-0.845)	0.766 (0.523-1.14)
10-min	0.122 (0.102-0.147)	0.166 (0.138-0.201)	0.231 (0.192-0.281)	0.292 (0.241-0.357)	0.386 (0.307-0.489)	0.469 (0.365-0.607)	0.564 (0.428-0.749)	0.674 (0.498-0.923)	0.848 (0.599-1.21)	1.10 (0.749-1.63)
15-min	0.147 (0.123-0.178)	0.200 (0.167-0.243)	0.280 (0.233-0.340)	0.353 (0.291-0.432)	0.466 (0.372-0.591)	0.567 (0.442-0.734)	0.682 (0.518-0.906)	0.815 (0.602-1.12)	1.02 (0.725-1.46)	1.33 (0.906-1.97)
30-min	0.232 (0.194-0.280)	0.316 (0.263-0.382)	0.440 (0.366-0.535)	0.555 (0.458-0.680)	0.734 (0.585-0.931)	0.892 (0.696-1.16)	1.07 (0.816-1.43)	1.28 (0.948-1.76)	1.61 (1.14-2.31)	2.09 (1.43-3.10)
60-min	0.357 (0.298-0.432)	0.486 (0.406-0.588)	0.678 (0.564-0.824)	0.855 (0.706-1.05)	1.13 (0.901-1.43)	1.37 (1.07-1.78)	1.65 (1.26-2.20)	1.98 (1.46-2.71)	2.49 (1.76-3.55)	3.22 (2.20-4.77)
2-hr	0.537 (0.448-0.649)	0.693 (0.578-0.839)	0.919 (0.765-1.12)	1.12 (0.925-1.37)	1.43 (1.14-1.81)	1.69 (1.31-2.19)	1.98 (1.50-2.63)	2.31 (1.70-3.15)	2.80 (1.98-4.00)	3.23 (2.21-4.79)
3-hr	0.658 (0.550-0.795)	0.835 (0.697-1.01)	1.09 (0.905-1.32)	1.31 (1.08-1.61)	1.64 (1.31-2.08)	1.92 (1.50-2.49)	2.23 (1.69-2.96)	2.57 (1.90-3.52)	3.09 (2.18-4.41)	3.52 (2.40-5.22)
6-hr	0.924 (0.772-1.12)	1.16 (0.965-1.40)	1.48 (1.23-1.80)	1.77 (1.46-2.16)	2.18 (1.74-2.76)	2.52 (1.96-3.27)	2.89 (2.20-3.84)	3.30 (2.43-4.51)	3.89 (2.75-5.55)	4.39 (2.99-6.49)
12-hr	1.21 (1.01-1.46)	1.52 (1.27-1.84)	1.96 (1.63-2.38)	2.34 (1.93-2.87)	2.89 (2.30-3.66)	3.34 (2.60-4.33)	3.83 (2.91-5.08)	4.36 (3.22-5.96)	5.13 (3.63-7.32)	5.77 (3.94-8.54)
24-hr	1.59 (1.41-1.83)	2.04 (1.80-2.36)	2.67 (2.36-3.10)	3.22 (2.81-3.76)	4.01 (3.39-4.83)	4.66 (3.86-5.73)	5.36 (4.34-6.74)	6.12 (4.82-7.91)	7.22 (5.47-9.73)	8.14 (5.97-11.3)
2-day	1.92 (1.70-2.22)	2.53 (2.24-2.92)	3.37 (2.97-3.91)	4.10 (3.58-4.78)	5.13 (4.35-6.19)	5.98 (4.96-7.35)	6.88 (5.57-8.66)	7.85 (6.19-10.2)	9.25 (7.01-12.5)	10.4 (7.62-14.5)
3-day	2.09 (1.85-2.41)	2.80 (2.47-3.23)	3.77 (3.33-4.37)	4.61 (4.03-5.38)	5.80 (4.91-6.99)	6.77 (5.61-8.32)	7.79 (6.31-9.81)	8.90 (7.02-11.5)	10.5 (7.94-14.1)	11.8 (8.63-16.4)
4-day	2.23 (1.98-2.58)	3.03 (2.67-3.49)	4.12 (3.63-4.76)	5.04 (4.41-5.89)	6.37 (5.39-7.67)	7.44 (6.17-9.15)	8.57 (6.95-10.8)	9.79 (7.72-12.7)	11.5 (8.73-15.5)	12.9 (9.49-18.0)
7-day	2.51 (2.22-2.89)	3.48 (3.07-4.01)	4.81 (4.24-5.57)	5.94 (5.19-6.93)	7.54 (6.39-9.09)	8.83 (7.33-10.9)	10.2 (8.26-12.8)	11.7 (9.20-15.1)	13.7 (10.4-18.5)	15.4 (11.3-21.5)
10-day	2.70 (2.38-3.11)	3.78 (3.34-4.37)	5.28 (4.65-6.11)	6.54 (5.72-7.64)	8.35 (7.07-10.1)	9.79 (8.13-12.0)	11.3 (9.18-14.3)	13.0 (10.2-16.8)	15.3 (11.6-20.6)	17.2 (12.6-23.9)
20-day	3.29 (2.91-3.80)	4.68 (4.13-5.40)	6.58 (5.80-7.62)	8.20 (7.17-9.57)	10.5 (8.90-12.7)	12.4 (10.3-15.2)	14.3 (11.6-18.0)	16.4 (13.0-21.3)	19.4 (14.7-26.2)	21.9 (16.0-30.4)
30-day	3.86 (3.42-4.45)	5.48 (4.84-6.33)	7.71 (6.80-8.93)	9.62 (8.41-11.2)	12.3 (10.4-14.9)	14.5 (12.1-17.9)	16.9 (13.7-21.2)	19.4 (15.3-25.1)	22.9 (17.4-30.9)	25.8 (18.9-36.0)
45-day	4.59 (4.06-5.29)	6.46 (5.71-7.46)	9.05 (7.97-10.5)	11.3 (9.85-13.1)	14.4 (12.2-17.4)	17.0 (14.1-20.9)	19.8 (16.0-24.9)	22.7 (17.9-29.4)	26.9 (20.4-36.3)	30.4 (22.3-42.3)
60-day	5.34 (4.73-6.16)	7.43 (6.57-8.58)	10.3 (9.11-12.0)	12.8 (11.2-15.0)	16.4 (13.9-19.8)	19.4 (16.1-23.8)	22.5 (18.2-28.3)	25.9 (20.4-33.5)	30.7 (23.3-41.4)	34.7 (25.4-48.3)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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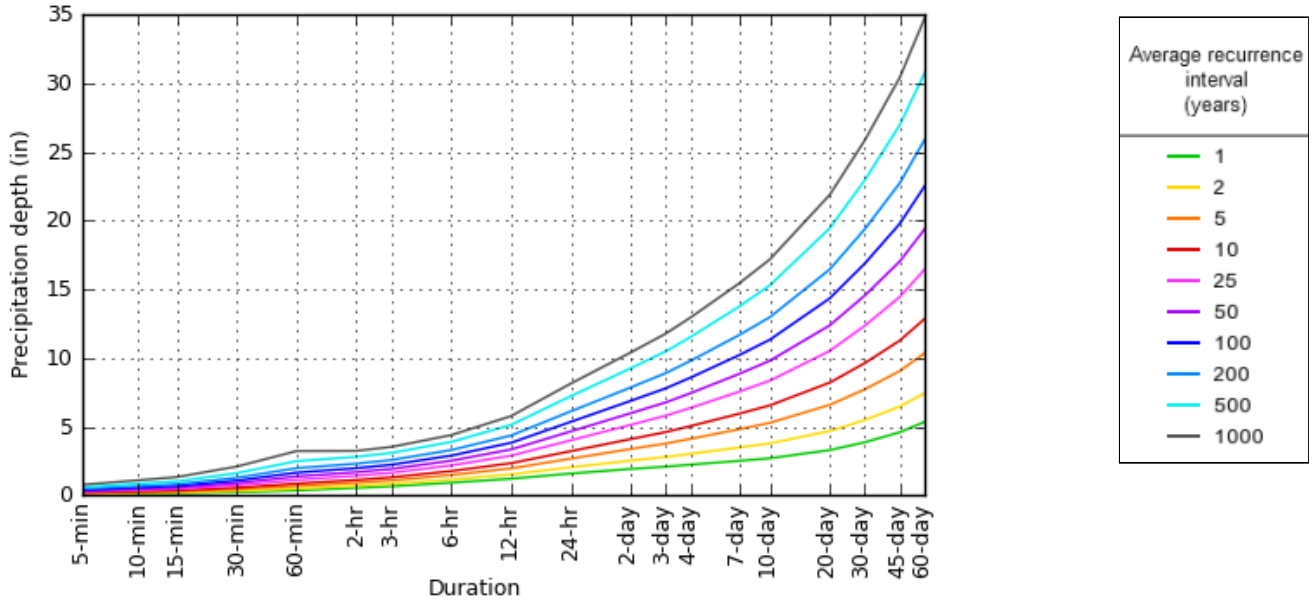
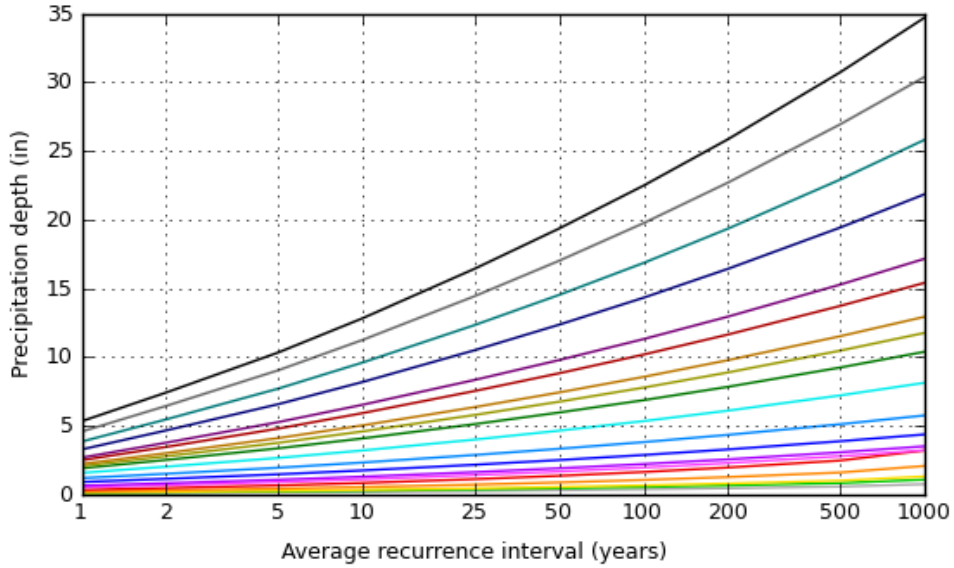
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 33.8123°, Longitude: -116.9967°





NOAA Atlas 14, Volume 6, Version 2

Created (GMT): Fri Sep 23 19:58:11 2022

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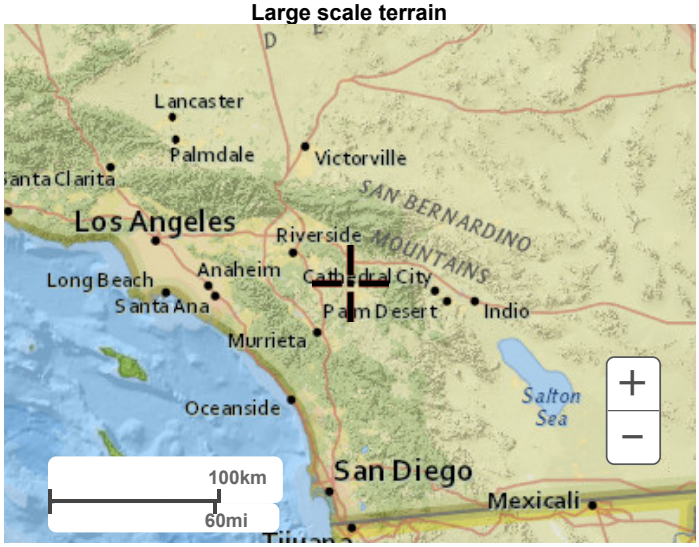
Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

LOCATION _____

ONE HOUR PRECIPITATION:

2-YR. _____ (PLATE D-4.3)

100-YR. _____ (PLATE D-4.4)

5-YR. _____ (PLATE D-4.5)

10-YR. _____ (PLATE D-4.5)

25-YR. _____ (PLATE D-4.5)

50-YR. _____ (PLATE D-4.5)

SLOPE OF INTENSITY DURATION CURVE _____ (PLATE D-4.6)

BY: _____ DATE: _____

CHECKED: _____ DATE: _____

RAINFALL INTENSITY – INCHES PER HOUR

10 7 5 4 3 2 1.5 1 .7 .5 .4 .3

S=0.43

1.65 IN/HR

S=.70
S=.60
S=.50
S=.40

5 10 15 20 25 30 40 50 60 80 100 120

STORM DURATION – MINUTES

0.43

1.65

4.72 IN/HR

RCFC & WCD

HYDROLOGY MANUAL

San Jacinto

INTENSITY – DURATION CURVES CALCULATION SHEET

PLATE D-4.7

May 2023

PRELIMINARY HYDROLOGY REPORT

For

Tentative Tract Map 38066
VALLE RESEDA

City of San Jacinto

County of Riverside, CA

HUNSAKER & ASSOCIATES IRVINE, INC.

APPENDIX E – TRAFFIC STUDY

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LOCAL TRAFFIC ASSESSMENT

For "Valle Reseda" Residential Development

In the City of San Jacinto

Date: June 2, 2023

Prepared For:

Golden Ocean Realty, LLC

608 Deodar Lane

Bradbury, CA 91008

Prepared By:

K2 Traffic Engineering, Inc.

1442 Irvine Blvd, Suite 210

Tustin, CA 92780

(714) 832-2116

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Local Traffic Assessment

For *"Valle Reseda"* Residential Development

N. Ramona Blvd, San Jacinto



Prepared under the supervision of

Jende Kay Hsu, P.E., T. E.

Lic. # T2285

EXECUTIVE SUMMARY

The purpose of this study is to evaluate the traffic impact of the proposed residential development located at the southwest side of Ramona Boulevard between Shimmering Way and Ranch View Lane in the City of San Jacinto. The project plans to construct a 206-unit single family residential development over a vacant and unimproved lot.

The project is expected to have a trip generation of 144 trips in the AM peak hour, including 37 inbound and 107 outbound trips, 194 trips in the PM peak hour, including 122 inbound and 72 outbound trips, and 1,943 daily trips. The study confirmed that the project will not result in any operational deficiencies at study intersections during construction and upon full completion. Therefore, local improvements are not required.

The study found that the intersection of Ramona Expressway and Sanderson Avenue has been operating below the City's target LOS D under existing conditions and in various study scenarios. However, the project's contribution to the pre-existing operational deficiency is negligible and, according to City's local traffic assessment guidelines, local improvements are not required.

Site access is provided on Ramona Boulevard by the proposed residential street temporarily named "A Street", which will be the main entrance to the project site. An exclusive westbound right-turn pocket and an exclusive westbound left-turn pocket will be provided on Ramona Boulevard. This access will be controlled by a STOP sign posted on "A Street" along with corresponding pavement markings.

The second access will be provided to Ramona Boulevard via Ranch View Lane and "F" Street. The third access point will be provided by "J" Street/De Anza Drive to provide a westerly connection to Sanderson Avenue. "J" Street/De Anza Drive will provide one lane in each direction with a pavement width of 26 feet. The intersection of De Anza Drive and Sanderson Avenue will be controlled by traffic signals. Upon project completion, De Anza Drive will serve as a Collector for the subject community solely until future developments progress in the surrounding area.

INTRODUCTION

The purpose of this study is to provide a local traffic assessment for the proposed residential development of 206-unit single family homes on vacant and unimproved lots (APN# 436-030-001, 436-040-006, and 436-040-008) at the south side of Ramona Boulevard between Shimmering Way and Ranch View Lane in the City of San Jacinto. The vicinity map is shown in **Exhibit 1**.

The proposed development includes three access points: "A" Street connecting easterly to Ramona Boulevard; "F" Street connecting Ranch View Lane as the second access point to Ramona Boulevard; and "J" Street/De Anza Drive connecting westerly to Sanderson Avenue. The proposed site plans are provided in **Exhibits 2** and **3**.

The main access "A" Street connecting easterly to Ramona Boulevard will be constructed in the first batch of 35 lots. The second access will be provided to Ramona Boulevard via Ranch View Lane and "F" Street in the second batch of 70 lots. These two access points will serve up to 158 lots in the year of 2027. "J" Street/De Anza Drive will be constructed along with the remaining batch of 48 lots to provide a westerly connection to Sanderson Avenue. The development timeline is shown in **Table 1**.

Table 1. Development Timeline

Year of Completion	Construction Batch	Lump Sum	Site Access	Traffic Distribution
2025	35 lots	35 lots	"A" St	Ramona Blvd
2026	70 lots	105 lots	"A" St and "F" St	Ramona Blvd
2027	53 lots	158 lots	"A" St and "F" St	Ramona Blvd
2028	48 lots	206 lots	"A" St, "F" St and "J" St/De Anza Dr	Ramona Blvd and Sanderson Ave

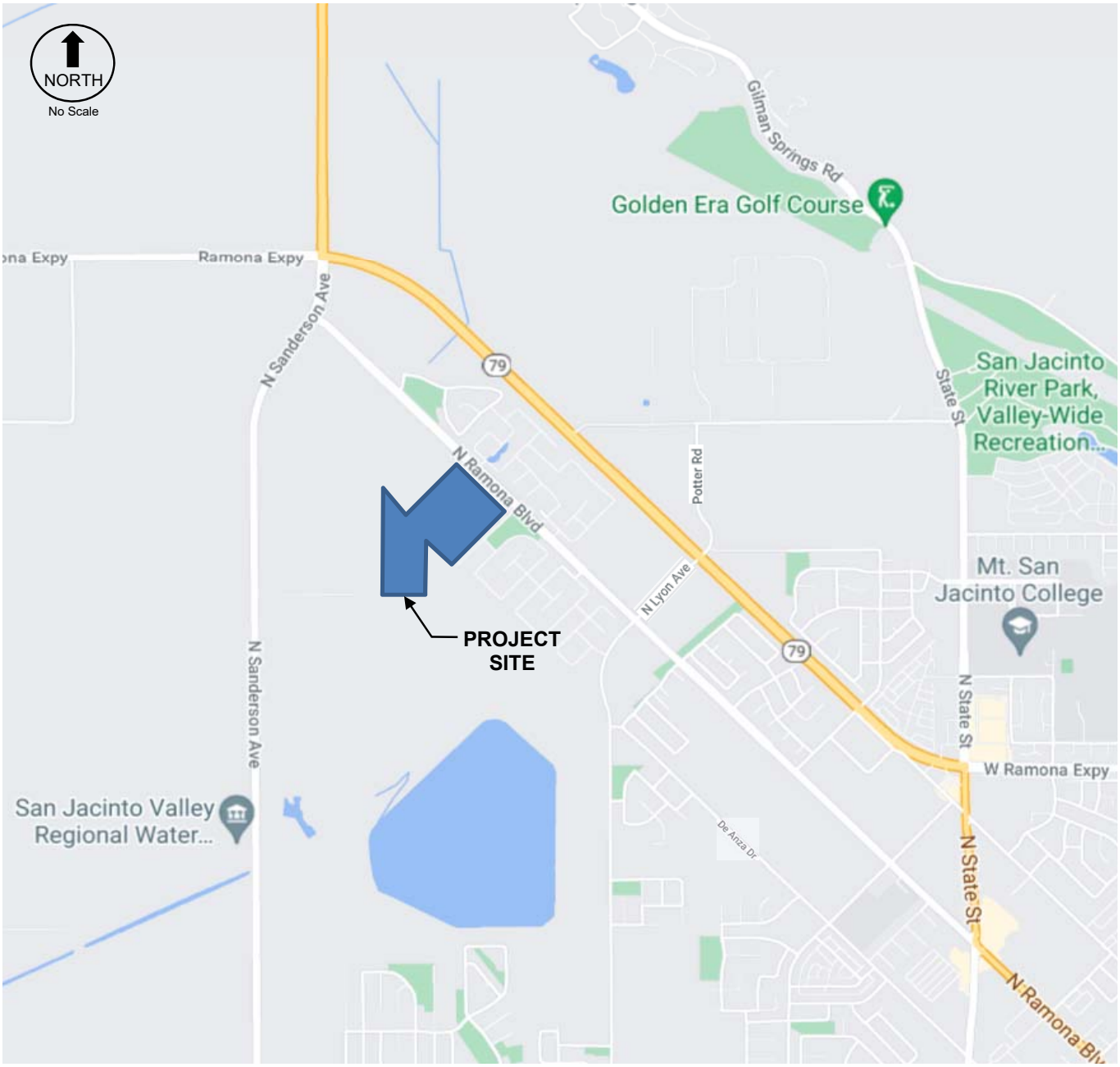
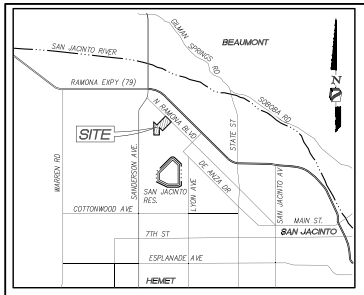


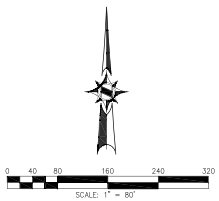
EXHIBIT 1. VICINITY MAP

No Scale

CITY OF SAN JACINTO
TENTATIVE TRACT MAP 38066



VICINITY MAP
N.T.S.



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CONCEPTUAL UTILITY PLAN	4
CONCEPTUAL SIGNING & STRIPING PLAN ALONG RAMONA BLVD	5
PRELIMINARY WQMP SITE PLAN	6

LEGAL DESCRIPTION:

THE LAND REFERRED TO HEREI BELOW IS SITUATED IN THE CITY OF SAN JACINTO, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL ONE:

THAT PORTION OF FARM LOT 129 OF LAND OF SAN JACINTO LAND ASSOCIATION IN THE CITY OF SAN JACINTO, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 8, PAGE 357 OF MAPS, RECORDS OF SAN DIEGO COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEASTERLY CORNER OF SAID LOT 129 WHICH CORNER IS ALSO THE NORTHEASTERLY CORNER OF FARM LOT 133 OF SAID LANDS OF SAN JACINTO LAND ASSOCIATION AS SHOWN BY MAP ON FILE IN BOOK 8, PAGE 357 OF MAPS, RECORDS OF SAN DIEGO COUNTY, CALIFORNIA; THENCE WESTERLY ALONG THE NORTHERLY LINE OF SAID LOT 133, A DISTANCE OF 561.00 FEET; THENCE NORTHERLY AND PARALLEL TO THE EASTERLY LINE OF SAID LOT 129, A DISTANCE OF 1,325.00 FEET, MORE OR LESS, TO THE NORTHEASTERLY LINE OF SAID LOT 129; THENCE SOUTHEASTERLY ALONG THE NORTHEASTERLY LINE OF SAID LOT 129, A DISTANCE OF 740.00 FEET, MORE OR LESS, TO THE MOST NORTHERLY CORNER OF FARM LOT 130 OF LANDS OF SAN JACINTO LAND ASSOCIATION AS SHOWN BY MAP ON FILE IN BOOK 8, PAGE 357 OF MAPS, RECORDS OF SAN DIEGO COUNTY CALIFORNIA; THENCE SOUTHERLY ALONG THE EASTERLY LINE OF SAID LOT 129, A DISTANCE OF 750.00 FEET, MORE OR LESS, TO THE TRUE POINT OF BEGINNING.

APN PORTION OF 439-030-001

PARCEL THREE:

THE SOUTHEASTERLY HALF OF FARM LOT 7 OF LANDS OF SAN JACINTO LAND ASSOCIATION, IN THE CITY OF SAN JACINTO, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 8, PAGE 357 OF MAPS, RECORDS OF SAN DIEGO COUNTY.
APN: 436-040-006

PARCEL FOUR:

THE NORTHWESTERLY QUARTER OF FARM LOT 9 OF LANDS OF SAN JACINTO LAND ASSOCIATION, IN THE CITY OF SAN JACINTO, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 8, PAGE 357 OF MAPS, RECORD OF OF SAN DIEGO COUNTY.
APN: 436-040-008

TITLE EXCEPTION AND EASEMENTS:

PER TITLE REPORT BY FIDELITY NATIONAL TITLE COMPANY DATED ON JANUARY 14, 2019
ORDER NUMBER: 00214622-994VNO-CH

* AN EASEMENT IN FAVOR OF THE PUBLIC FOR ROAD PURPOSES (DE ANZA DRIVE) PER MAP OF THE "LANDS OF SAN JACINTO LAND ASSOCIATION", M.B. 8/357 SAN DIEGO COUNTY.

(Y) RIGHTS OF THE PUBLIC IN AND TO ANY PORTION OF THE PROPERTY HEREIN DESCRIBED LYING WITHIN DE ANZA DRIVE. A PORTION OF WHICH WAS ACCEPTED IN A RESOLUTION EXECUTED BY THE BOARD OF SUPERVISORS FOR THE COUNTY OF RIVERSIDE

RECORDING DATE: JANUARY 27, 1953
RECORDING NO.: BOOK 1435, PAGE 487, OFFICIAL RECORS

BENCHMARK:

RIVERSIDE COUNTY BENCH MARK
H-48, AUGUST 1985
ELEV. = 1464.075

0.3 MILE SE'LY ALONG RAMONA BLVD., FROM THE INTERSECTION OF SANDERSON AVE AND RAMONA BLVD., 1 FT. ± N'LY OF THE S'LY END OF A 5FT LONG X 2 FT HIGH CONCRETE HEADWALL; 45 FT ± E'LY OF THE NE'LY CORNER OF A CONCRETE DRIVEWAY AT 37835 RAMONA BLVD., SET A STD. 3" DIA. ALUM. DISK, STAMPED AS ABOVE, IN THE TOP OF HEADWALL.

FLOODZONE:

ACCORDING TO THE COUNTY OF MORENO VALLEY BLVD AND BASED UPON THE NATIONAL INSURANCE PROGRAM MAPS THIS SITE LIES WITHIN FLOOD ZONE A SHADED, COMMUNITY PANEL NO. 06065C1490H DATED APRIL 19, 2017 AND 06065C1470H, AUGUST 28, 2008 AND 06065C1480H, AUGUST 287, 2008 PUBLISHED BY THE TEDERAL INSURANCE ADMINISTRATION.

LEGEND:

- PROJECT BOUNDARY LINE
- LOT LINE
- CENTER LINE
- R/W
- EASEMENTS
- STORM DRAIN
- SEWER LINE
- WATER LINE
- RETAINING WALL

GENERAL NOTES:

PROJECT LOCATION:	SW SIDE OF RAMONA BLVD BETWEEN SHIMMERING WAY AND RANCH VIEW LANE, SAN JACINTO, CA 92582
ASSESSOR PARCEL NUMBER:	436-030-001, 436-040-006 & 436-040-008
EXISTING AND PROPOSED ZONING DESIGNATION:	RM / RL
PLAN DESIGNATION:	RM / RL
SUBDIVISION ACREAGE:	37.87 ACRE
DATE MAP PREPARED:	OCTOBER, 2022
NUMBERED LOTS / DWELLING UNITS:	184 LOTS
MIN. LOT SIZE:	4,800 SF
NUMBER OF OPEN SPACE LOTS:	3 LOTS

PHASE #	TOTAL
1	34 LOTS
2	64 LOTS
3	44 LOTS
4	42 LOTS
TOTAL	184 LOTS

OWNER/DEVELOPER:

CAMELLIA HOMES
8201 GRAND DRIVE
HUNTINGTON BEACH, CA 92646
PHONE: (858) 997-7973

UTILITY PURVEYORS

WATER & SEWER:
EASTERN MUNICIPAL WATER DISTRICT
2270 TRUMBLE ROAD, PERRIS, CALIFORNIA 92572
PH: (951) 928-3777

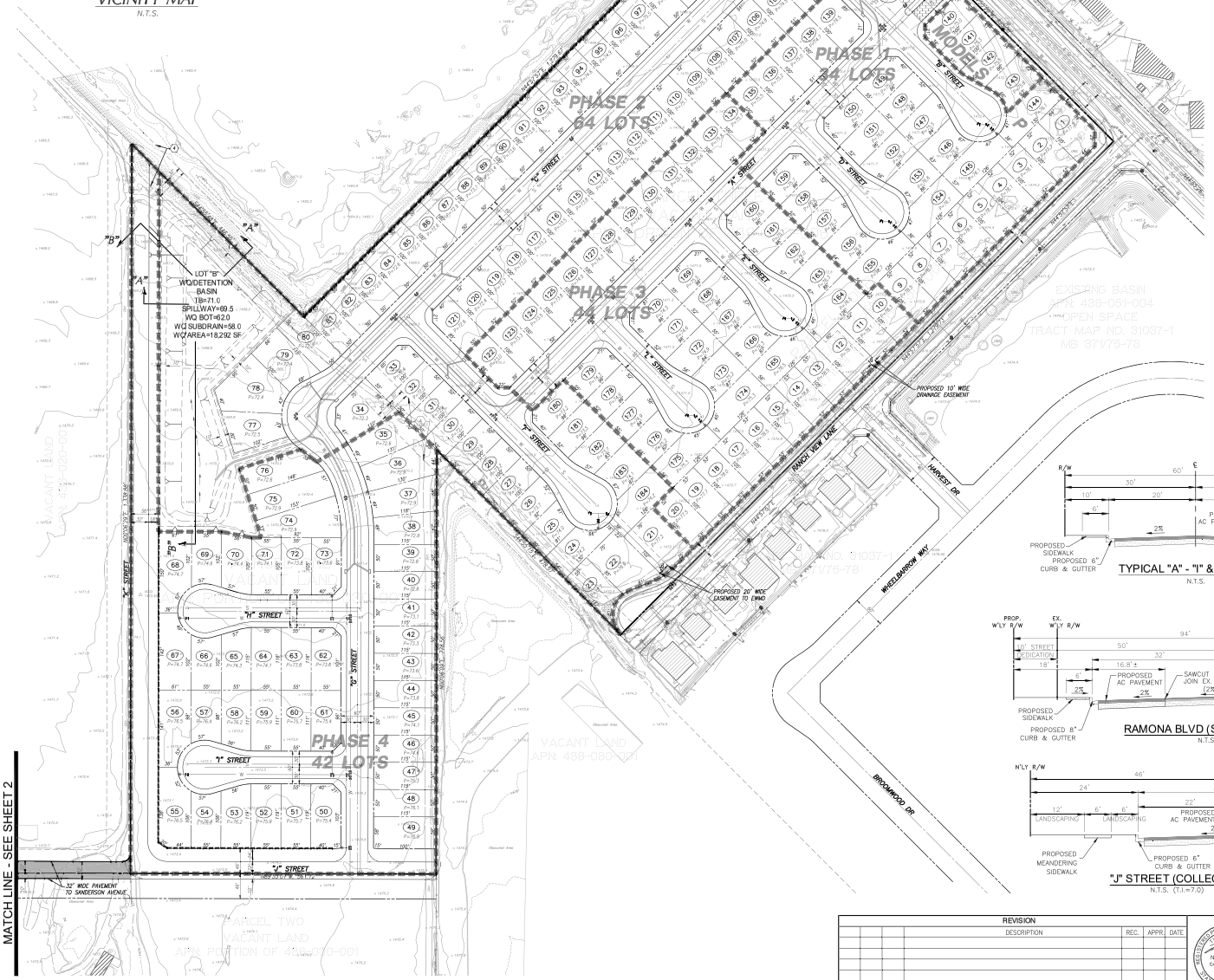
ALEX SALAZAR
PH: (909)335-7602
ASALAZAR@SOCALGAS.COM

CABLE / CHARTER:
JOSH VOLLMER
PH: (858) 652-8236
JOSHUA.VOLLMER@CHARTER.COM

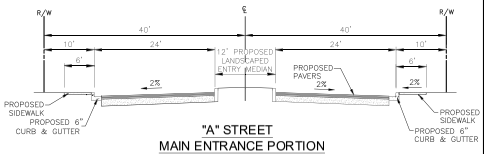
TELEPHONE/FRONTIER
REBECCA SMITH
PH: (909) 748-6643
REBECCA.SMITH1@FTR.COM

SCE
LETICIA MENDOZA
PH: (951) 212-2366
LETICIA.MENDOZA@SCE.COM

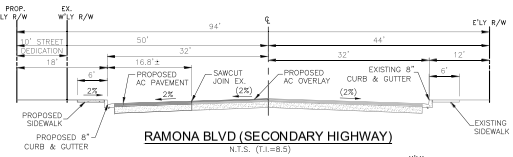
SCHOOL DISTRICT:
SAN JACINTO UNIFIED SCHOOL DISTRICT
20455 SOUTH SAN JACINTO AVENUE
SAN JACINTO, CA 92583
PH: (800) 892-2253



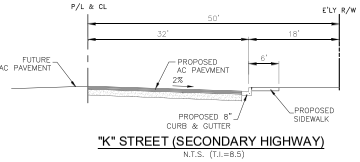
TYPICAL "A" - "I" & "L" STREET
N.T.S.



"A" STREET
MAIN ENTRANCE PORTION
N.T.S.

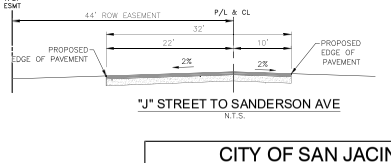


RAMONA BLVD (SECONDARY HIGHWAY)
N.T.S. (T.I.=8.5)



"K" STREET (SECONDARY HIGHWAY)
N.T.S. (T.I.=8.5)

"J" STREET (COLLECTOR)
N.T.S. (T.I.=7.0)



"J" STREET TO SANDERSON AVE
N.T.S.

REVISION			
DESCRIPTION	REC.	APPR.	DATE

HUNSAKER & ASSOCIATES IRVINE INC.
PLANNING ■ ENGINEERING ■ SURVEYING
Three Hughes Irvine, CA 92618 • PH: (949) 583-1010 • FX: (949) 583-0759

PREPARED UNDER THE SUPERVISION OF:

TIN N. HUYNH R.C.E. NO. 69273 DATE

REGISTERED PROFESSIONAL ENGINEER TIN N. HUYNH NO. 69273 Exp. 06/30/24 CIVIL STATE OF CALIFORNIA

CITY OF SAN JACINTO
CALIFORNIA

VALLE RESEDA
TENTATIVE TRACT MAP
N. RAMONA BLVD SAN JANCINTO, CA 92582

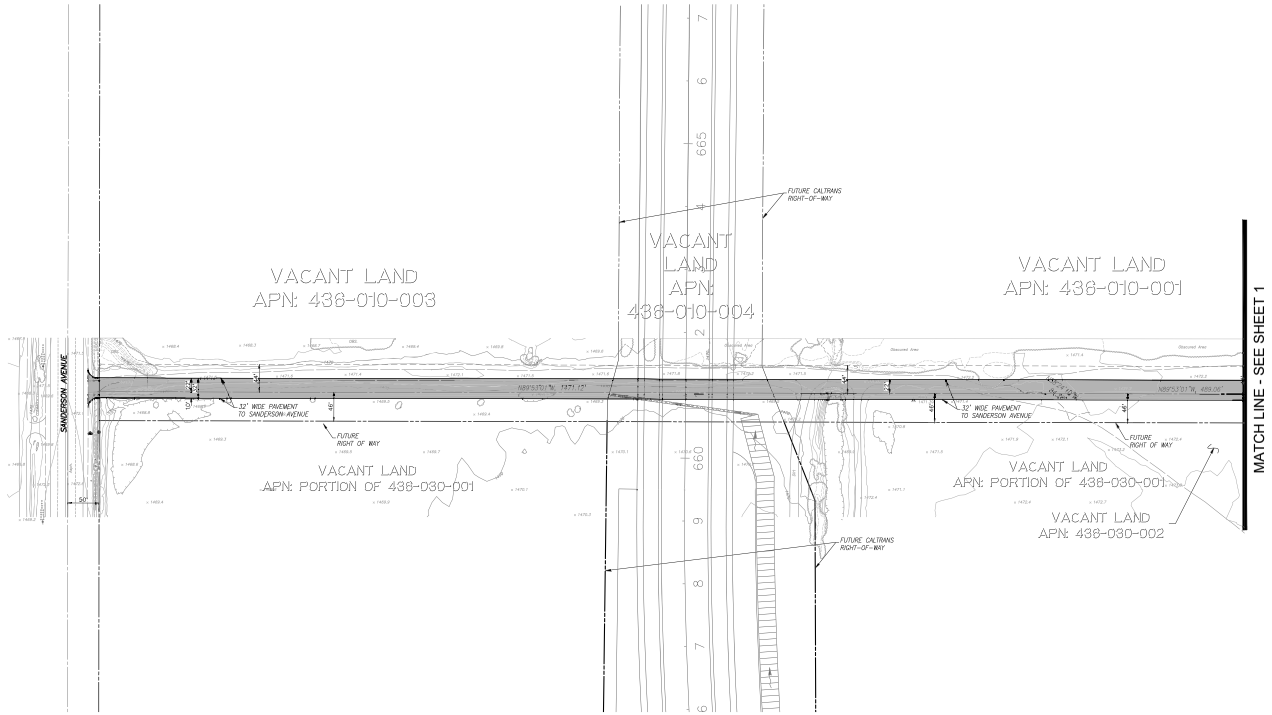
SCALE: AS SHOWN
DRAWING NO.
PROJECT NO.
SHEET 1 OF 6 SHEETS

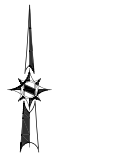
W.O. 451-1 TRACT NO. 38066 TENTATIVE TRACT MAP

PLOTTED BY: Sophie Pham DATE: Jan. 20, 2023 01:07:25 PM FILE: F:\1244\Planning\SA_Site\Exh_TTM\SHT01.dwg

CITY OF SAN JACINTO

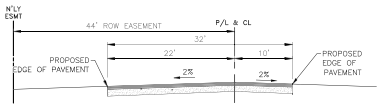
TENTATIVE TRACT MAP 38066





LEGEND:

- PROJECT BOUNDARY LINE
- LOT LINE
- CENTER LINE
- R/W
- EASEMENTS
- STORM DRAIN
- SEWER LINE
- WATER LINE
- PROPSOED AC PAVEMENT



"J" STREET TO SANDERSON AVE

N.T.S.

LOT AREA TABLE

Lot No.	Lot Area (SF)	Lot No.	Lot Area (SF)	Lot No.	Lot Area (SF)	Lot No.	Lot Area (SF)
1	6,511	51	6,325	101	4,999	151	5,009
2	**5,460**	**52**	**6,325**	**102**	**4,863**	**152**	**5,035**
3	5,460	53	6,012	103	4,985	153	5,041
4	**5,460**	**54**	**5,358**	**104**	**6,134**	**154**	**6,554**
5	5,460	55	7,926	105	5,070	155	6,517
6	**5,460**	**56**	**7,857**	**106**	**5,100**	**156**	**5,083**
7	5,460	57	5,363	107	5,200	157	5,029
8	**5,460**	**58**	**5,817**	**108**	**5,200**	**158**	**5,005**
9	5,460	59	6,130	109	5,200	159	5,180
10	**5,460**	**60**	**6,130**	**110**	**5,200**	**160**	**5,178**
11	5,460	61	6,026	111	5,200	161	5,002
12	**6,300**	**62**	**6,249**	**112**	**5,200**	**162**	**5,022**
13	5,513	63	6,355	113	5,200	163	5,080
14	**5,513**	**64**	**6,355**	**114**	**5,200**	**164**	**6,519**
15	5,513	65	6,044	115	5,200	165	6,536
16	**5,513**	**66**	**5,388**	**116**	**5,200**	**166**	**5,085**
17	5,513	67	7,960	117	5,210	167	5,014
18	**5,513**	**68**	**8,247**	**118**	**5,190**	**168**	**5,015**
19	5,513	69	5,385	119	5,200	169	5,181
20	**5,513**	**70**	**5,753**	**120**	**5,200**	**170**	**5,173**
21	7,989	71	5,775	121	5,389	171	5,005
22	**8,204**	**72**	**5,775**	**122**	**5,379**	**172**	**5,000**
23	5,716	73	5,664	123	5,200	173	5,074
24	**5,636**	**74**	**8,368**	**124**	**5,200**	**174**	**6,535**
25	5,006	75	7,604	125	5,200	175	6,557
26	**5,075**	**76**	**6,726**	**126**	**5,200**	**176**	**5,084**
27	5,000	77	6,357	127	5,200	177	5,022
28	**5,000**	**78**	**9,561**	**128**	**5,200**	**178**	**5,020**
29	5,000	79	6,959	129	5,200	179	5,185
30	**5,000**	**80**	**5,945**	**130**	**5,200**	**180**	**5,174**
31	5,000	81	5,000	131	5,200	181	5,006
32	**4,999**	**82**	**5,000**	**132**	**5,200**	**182**	**5,003**
33	5,388	83	5,000	133	5,200	183	5,068
34	**7,453**	**84**	**5,000**	**134**	**5,200**	**184**	**6,555**
35	6,875	85	5,000	135	5,200	LOT "A"	18,450
36	**7,992**	**86**	**5,000**	**136**	**5,200**	**LOT "B"**	**99,411**
37	7,075	87	5,000	137	5,100	LOT "C"	15,250
38	**6,384**	**88**	**5,000**	**138**	**5,070**		
39	5,750	89	5,000	139	6,388		
40	**5,750**	**90**	**5,000**	**140**	**5,185**		
41	5,750	91	5,001	141	5,049		
42	**5,750**	**92**	**5,001**	**142**	**5,061**		
43	5,750	93	5,001	143	5,168		
44	**5,750**	**94**	**5,001**	**144**	**6,351**		
45	5,750	95	5,001	145	6,557		
46	**5,750**	**96**	**5,001**	**146**	**5,033**		
47	5,750	97	5,001	147	5,027		
48	**5,750**	**98**	**5,001**	**148**	**5,002**		
49	6,273	99	5,001	149	5,177		
50	**6,174**	**100**	**5,001**	**150**	**5,186**		

REVISION			
DESCRIPTION	REC.	APPR.	DATE

TIN N. HUYNH R.C.E. NO. 69273 Exp. 06/30/24 CIVIL STATE OF CALIFORNIA

DATE

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PREPARED UNDER THE SUPERVISION OF:

CITY OF SAN JACINTO
CALIFORNIA

VALLE RESEDA
TENTATIVE TRACT MAP
N. RAMONA BLVD SAN JANCINTO, CA 92582

SCALE: AS SHOWN

DRAWING NO. | PROJECT NO. | SHEET 2 OF 6 SHEETS

W.O. 4513-1 TRACT NO. 38066 TENTATIVE TRACT MAP

PLOTTED BY: Sophie Pham DATE: Jan. 20, 2023 01:07:54 PM FILE: F:\1244\Planning\SA_Site\Exh_TTM\SHT02.dwg

STUDY SCENARIOS

Until the completion of J Street/De Anza Drive, project traffic will be distributed solely to Ramona Boulevard. The study will evaluate whether the project traffic of up to 158 units completed in the year of 2027 will result in any significant impact during this stage. The following scenarios will be included in the level of service analysis:

i. Existing Conditions
ii. Partial Development (Year 2027, up to 158 units) Without Project
iii. Partial Development (Year 2027, up to 158 units) Plus Project
iv. Full Completion (Year 2028) Without Project
v. Full Completion (Year 2028) Plus Project
vi. Full Completion (Year 2028) Plus Project with Mitigation Measure, If Necessary

The following intersections are studied for level of service analysis to evaluate the potential traffic impacts:

1. Sanderson Avenue at Ramona Expressway
2. Sanderson Avenue at Ramona Boulevard
3. Lyon Avenue/Potter Road at Ramona Expressway
4. Lyon Avenue at Ramona Boulevard
5. Ramona Boulevard at A Street
6. Sanderson Avenue at J Street/De Anza Drive

The scoping agreement approved by the City of San Jacinto can be found in **Appendix A.** The Level of Service (LOS) analysis is performed using SYNCHRO software based on the methodologies prescribed in the Highway Capacity Manual (HCM). For signalized intersections, the average control delay per vehicle is estimated for each lane group and aggregated for each approach and for the intersection as a whole. For unsignalized intersections, level of service is related to the control delay for each stop-controlled movement.

Table 3 provides the relationship between control delay per vehicle and LOS for both signalized and unsignalized intersections.

Table 2. LOS Definitions

LOS	Signalized Average Control Delay (sec/veh)	Unsignalized Average Control Delay (sec/veh)	General Description
A	0 - 10	0 - 10	Free Flow
B	> 10 - 20	> 10 - 15	Stable Flow (slight delays)
C	> 20 - 35	> 15 - 25	Stable Flow (acceptable delays)
D	> 35 - 55	> 25 - 35	Approaching Unstable Flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	> 55 - 80	> 35 - 50	Unstable Flow (intolerable delay)
F	> 80	> 50	Forced Flow (congested and queues fail to clear)

EXISTING CONDITIONS

The project is located on the southwest side of Ramona Boulevard between Shimmering Way and Ranch View Lane in the City of San Jacinto. The site is currently vacant and unimproved.

Ramona Boulevard is classified as a Secondary Roadway in the General Plan's roadway system map. It generally runs east-westerly with one lane in each direction divided by a stripped median. The posted speed limit is 45 mph in the project vicinity.

Sanderson Avenue is a north-southerly Urban Arterial in the General Plan's roadway system map that currently provides two lanes in each direction divided by a two-way-left-turn lane south of Ramona Boulevard. The posted speed limit is 55 mph in the project vicinity.

Ramona Expressway is a Limited Access Conventional Highway in the project vicinity and currently provides three lanes in each direction divided by a raised median and left turn lanes at major intersections. The posted speed limit is 65 mph in the project vicinity.

Lyon Avenue is a north-southerly Major Roadway in General Plan's roadway system map that currently provides one lane in each direction. The posted speed limit is 45 mph in the project vicinity. The intersection of Lyon Avenue and Ramona Boulevard is controlled by stop signs for all approaches. The intersection of Lyon Avenue and Ramona Expressway is controlled by traffic signals.

De Anza Drive is a Collector in General Plan's roadway system map that begins at Lyon Avenue and extends southerly to Main Street. It currently provides one lane in each direction and has a posted speed limit of 40 mph.

Turning movement counts in the AM and PM peak hour were collected on Thursday, July 29, 2021. The existing lane configuration and traffic volumes at the study intersections are shown in **Exhibit 4**. Complete traffic data can be found in **Appendix B**.

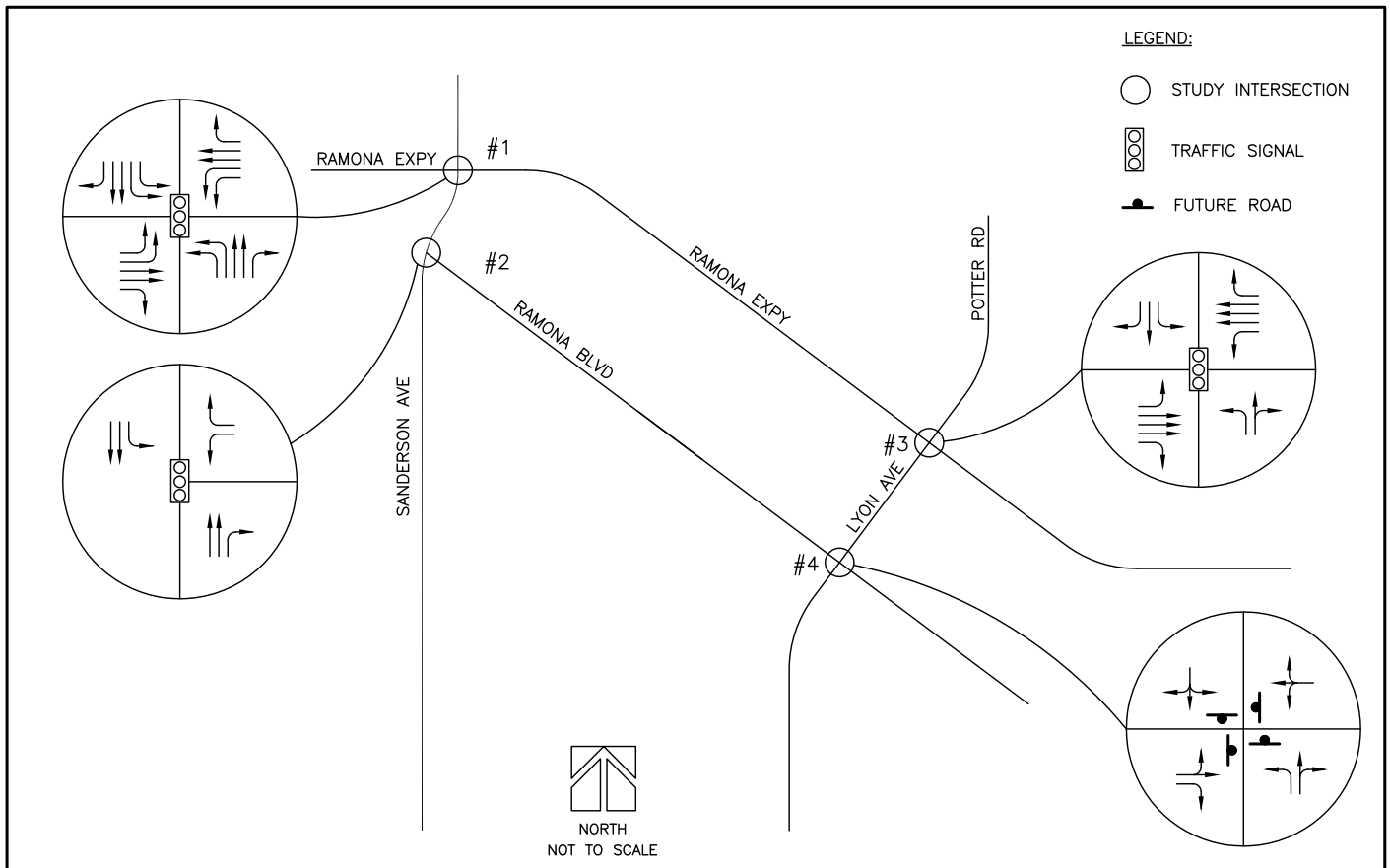
Level of service (LOS) and overall delay for existing conditions are shown in **Table 4**. The analysis worksheets can be found in **Appendix C**. For existing conditions, all study intersections currently operate at LOS D or better during the AM and PM peak hours, except for the following location:

- Sanderson Avenue at Ramona Expressway (#1): LOS F in the AM peak Hour

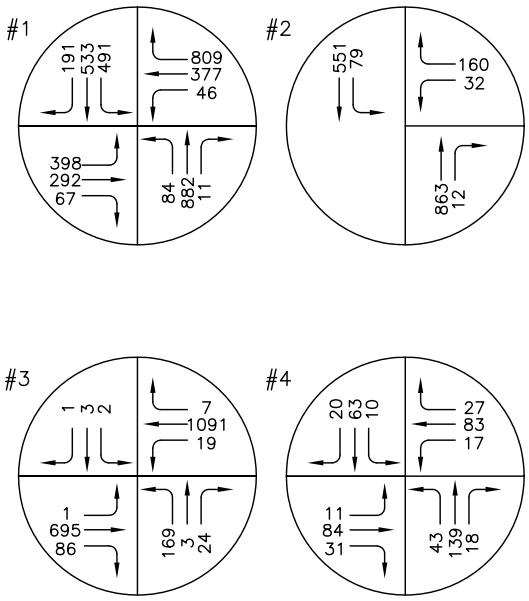
Table 3. Existing Conditions

Intersection	Control Type	AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
1. Sanderson Ave at Ramona Expy	TS	F	92.3	D	47.8
2. Sanderson Ave at Ramona Blvd	TS	B	10.7	B	15.7
3. Lyon Ave/Potter Rd at Ramona Expy	TS	C	24.7	C	25.8
4. Lyon Ave at Ramona Blvd	AWSC	A	9.5	B	11.2

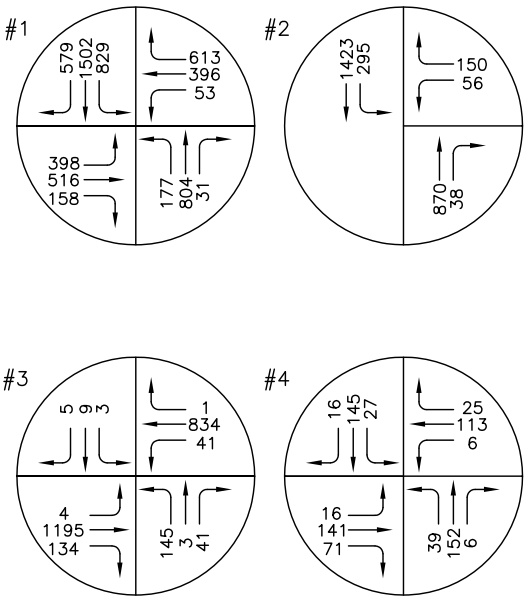
Note: TS = Traffic Signal; AWSC = All-way-stop control; TWSC = Two-way-stop control; Delay in seconds



AM PEAK HOUR



PM PEAK HOUR



EXISTING LANE CONFIGURATION AND TRAFFIC VOLUMES

EXHIBIT 4

TRIP GENERATION

Trip generation represents the amount of traffic attracted and produced by the project development. Based upon the recommendations of "*Trip Generation*, *11th Edition*," published by the Institute of Transportation Engineers (ITE), applicable trip generation rates are shown in **Table 5**.

Table 4. Trip Generation Rate

Land Use	Unit	Daily	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
Single-Family Detached Housing (210)	Dwelling Unit	9.43	0.70	26%	74%	0.94	63%	37%

A total of 158 lots will be developed in the initial batches while site access is provided solely via Ramona Boulevard. Trip generation for the partial development of 158 lots as well as full completion of 206 lots can be found in **Table 6**. Upon full completion, the project is expected to have a trip generation of 144 trips in the AM peak hour, including 37 inbound and 107 outbound trips, 194 trips in the PM peak hour, including 122 inbound and 72 outbound trips, and 1,943 daily trips.

Table 5. Project Trip Generation

Land Use	Quantity	Unit	AM Peak Hour			PM Peak Hour			Daily
			Total	In	Out	Total	In	Out	
Partial Development (Year 2027)	158	Dwelling Unit	111	29	82	149	94	55	1,490
Full Completion (Year 2028)	**206**	Dwelling Unit	144	37	107	194	122	72	1,943

TRIP DISTRIBUTION

Trip distribution represents the directional orientation of traffic to and from the proposed project. Directional orientation is largely influenced by the geographical location of the site, among many other factors. The trip distribution patterns for partial development in year 2027 and full completion in 2028 are illustrated in **Exhibits 5 and 6**, respectively.

TRAFFIC ASSIGNMENT

The traffic assignment to and from the site has been based upon the results of trip generation, trip distribution, and access layouts. Traffic assignment in the AM and PM peak hour for partial development in year 2027 and full completion in 2028 are illustrated in **Exhibits 7 and 8**, respectively.

EXHIBIT 5. TRIP DISTRIBUTION (Year 2027)

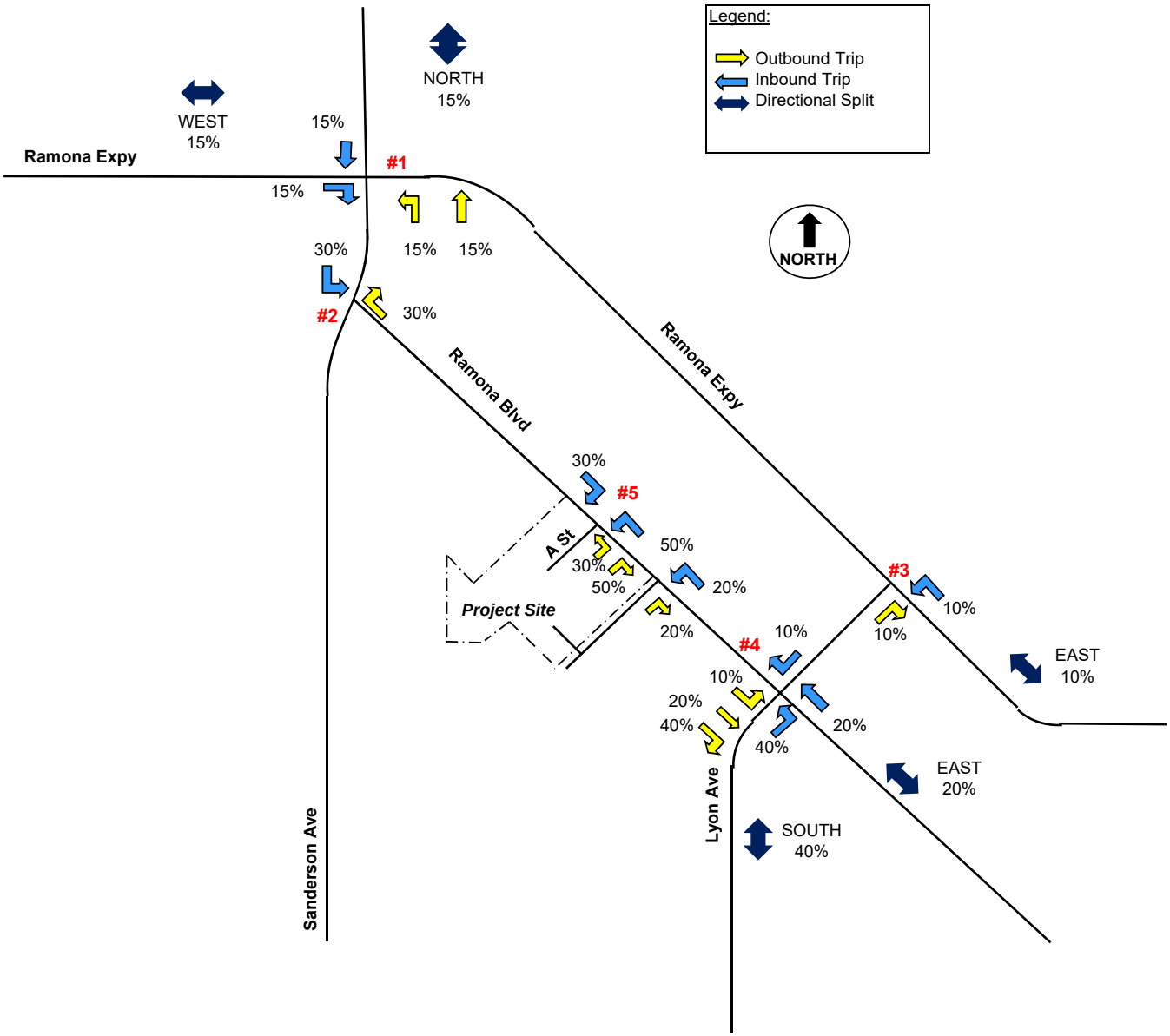
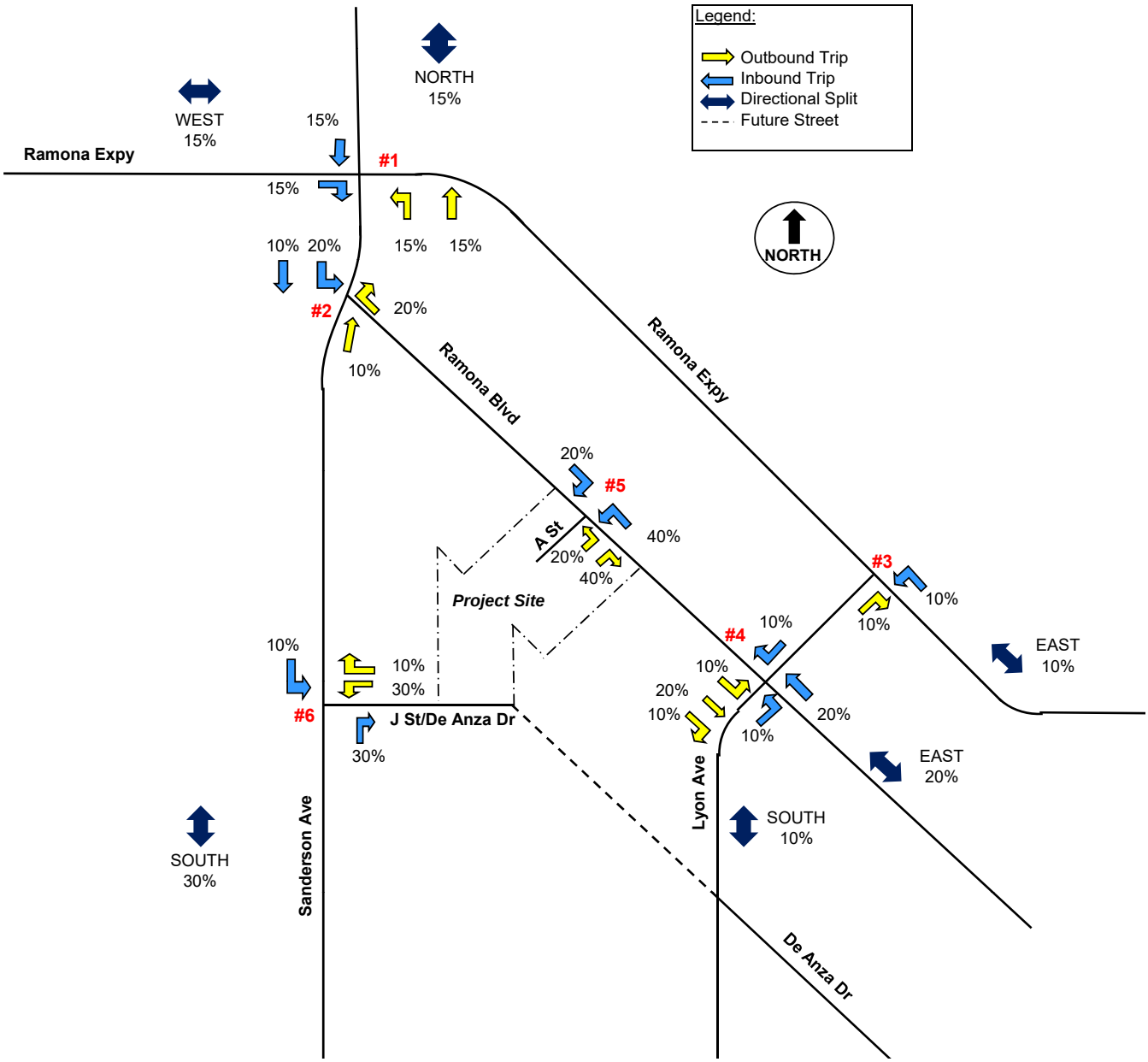
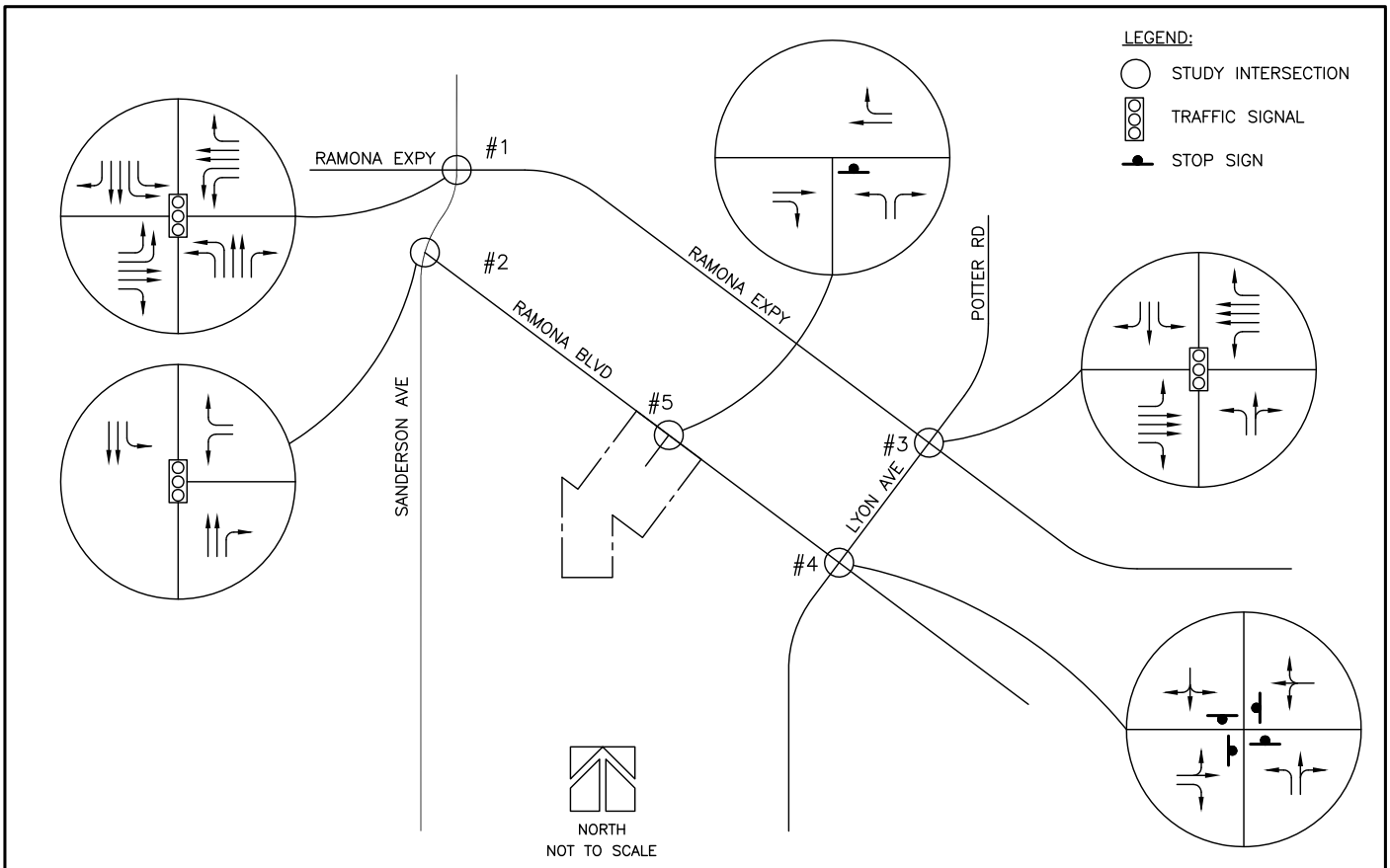
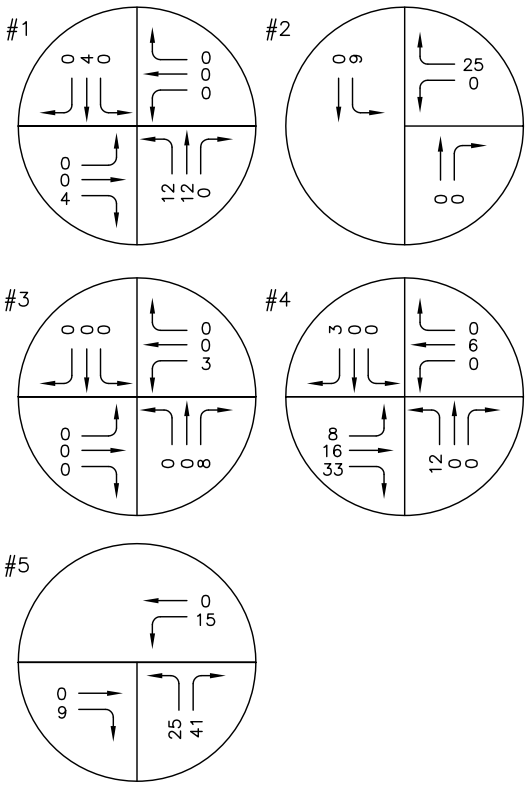


EXHIBIT 6. TRIP DISTRIBUTION (After Year 2028)

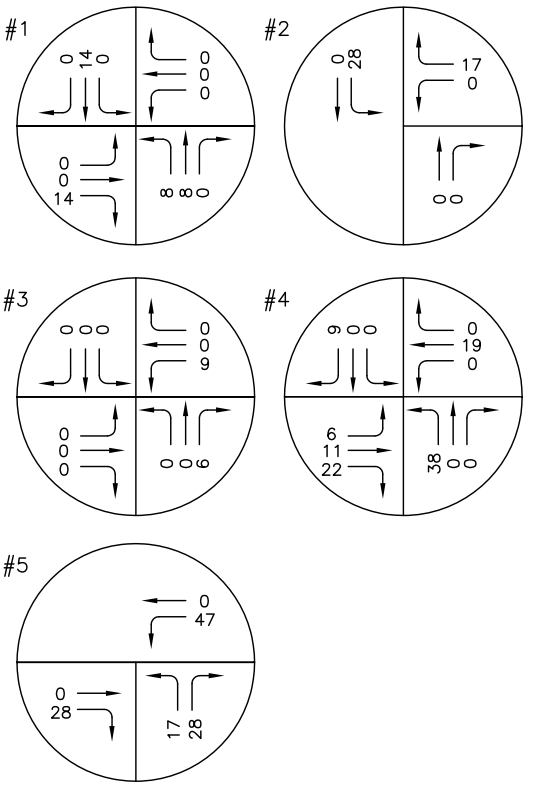




AM PEAK HOUR

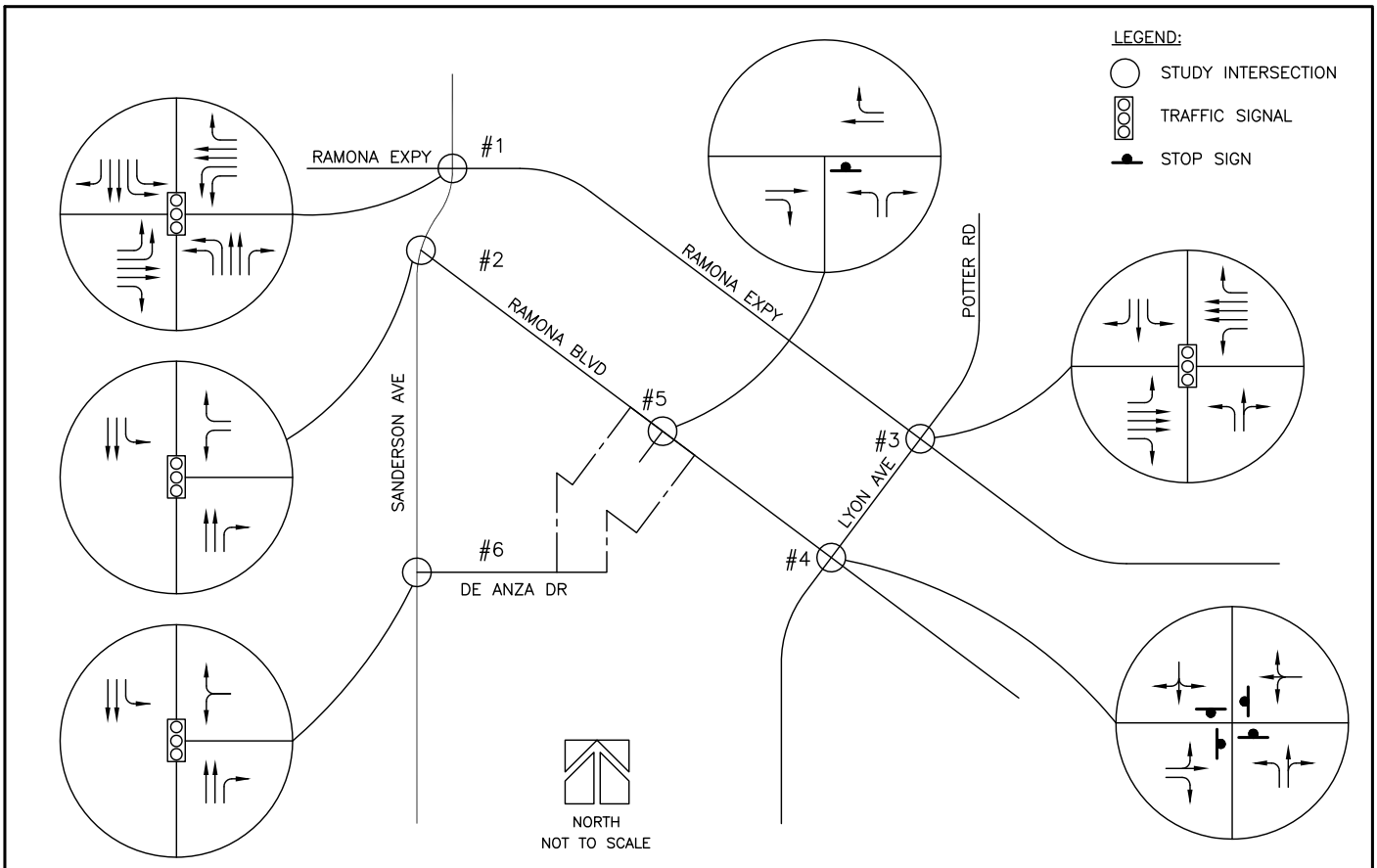


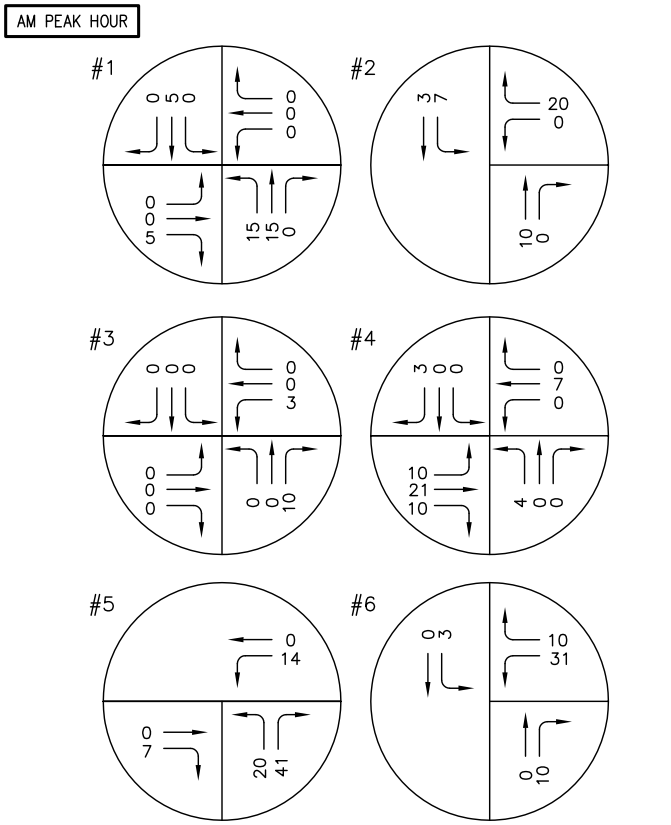
PM PEAK HOUR

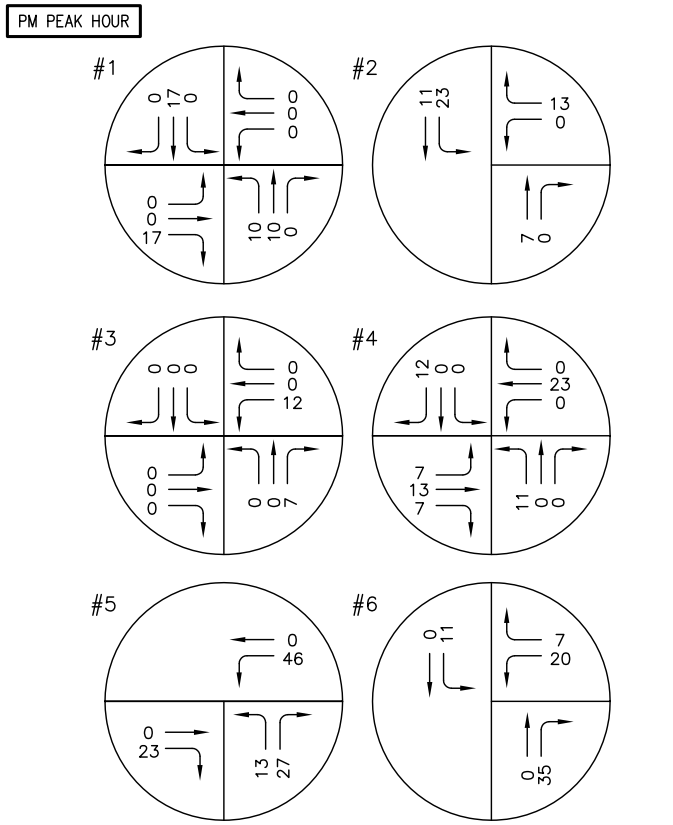


TRAFFIC ASSIGNMENT (YEAR 2027)

EXHIBIT 7







TRAFFIC ASSIGNMENT (AFTER YEAR 2028)
EXHIBIT 8

YEAR 2027 BASELINE WITHOUT PROJECT

To factor in the background growth of regional traffic, the annual ambient growth rate of two percent (2%) is used according the traffic scoping agreement. The anticipated traffic volumes for the year of 2027 are illustrated in **Exhibit 9**.

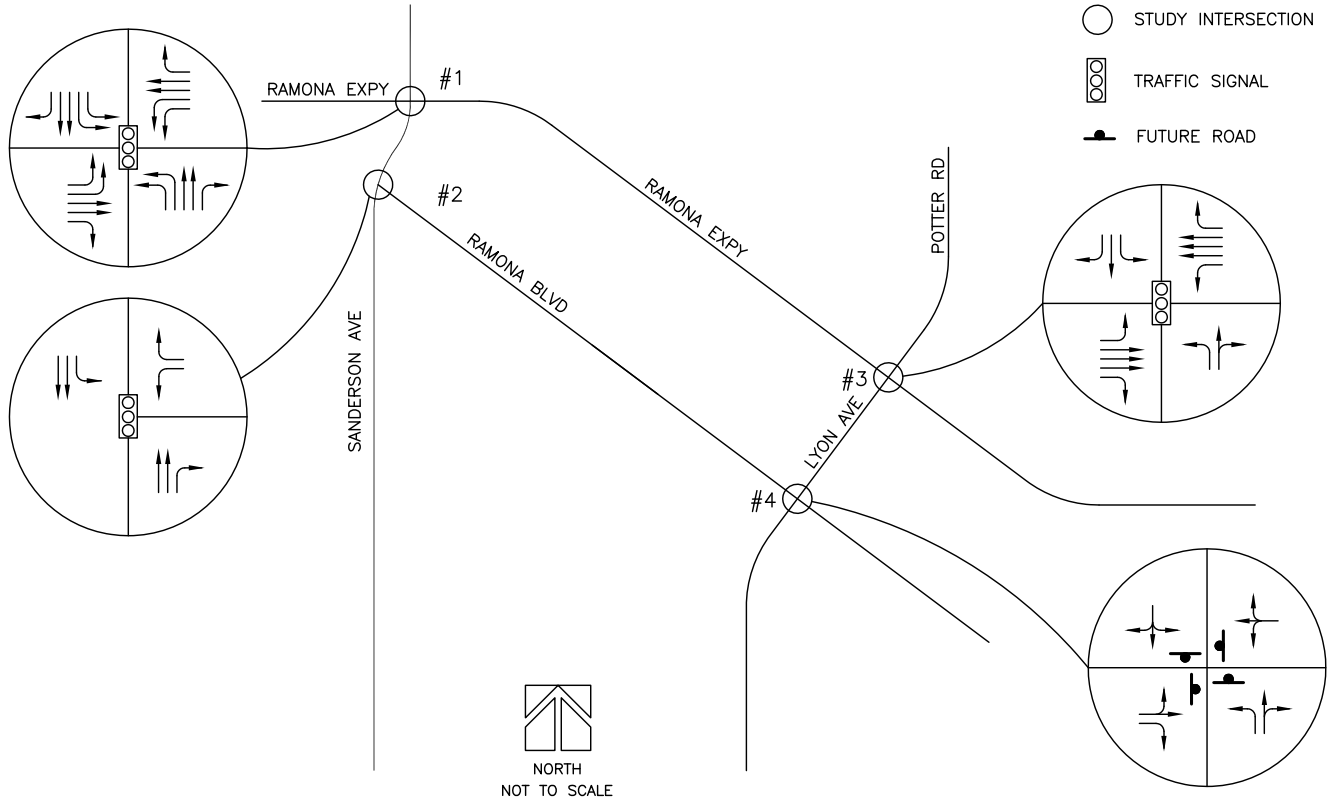
The levels of service in the AM and PM peak hour for this scenario are shown in **Table 6**. The analysis worksheets can be found in **Appendix C**. All study intersections will operate at LOS D or better except for the following intersection:

- Sanderson Avenue at Ramona Expressway (#1): LOS F in the AM peak hour, LOS E in the PM peak hour

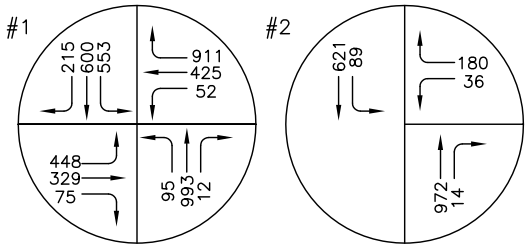
Table 6. Year 2027 Baseline without Project

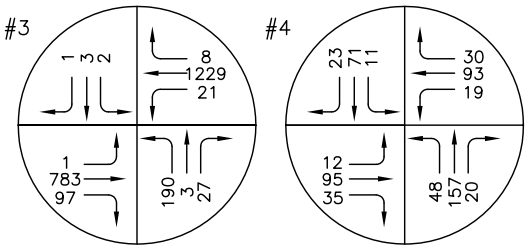
Intersection	Control Type	AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
1. Sanderson Ave at Ramona Expy	TS	F	107.6	E	72.1
2. Sanderson Ave at Ramona Blvd	TS	B	12.3	B	19.3
3. Lyon Ave/Potter Rd at Ramona Expy	TS	C	28.9	D	35.2
4. Lyon Ave at Ramona Blvd	AWSC	A	10.0	B	12.2

Note: TS = Traffic Signal; AWSC = All-way-stop control; TWSC = Two-way-stop control; Delay in seconds

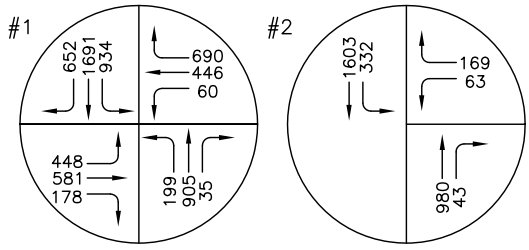


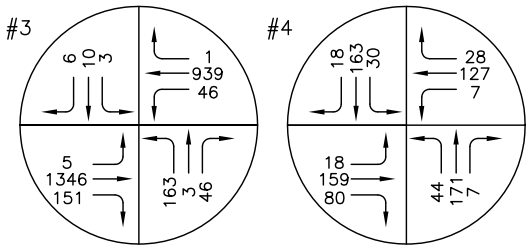
AM PEAK HOUR





PM PEAK HOUR





YEAR 2027 BASELINE WITHOUT PROJECT
EXHIBIT 9

YEAR 2027 PLUS PROJECT

Traffic volumes for the year of 2027 plus project traffic based on completion of 158 units are illustrated in **Exhibit 10**. Analysis worksheets for this scenario are provided in **Appendix C**.

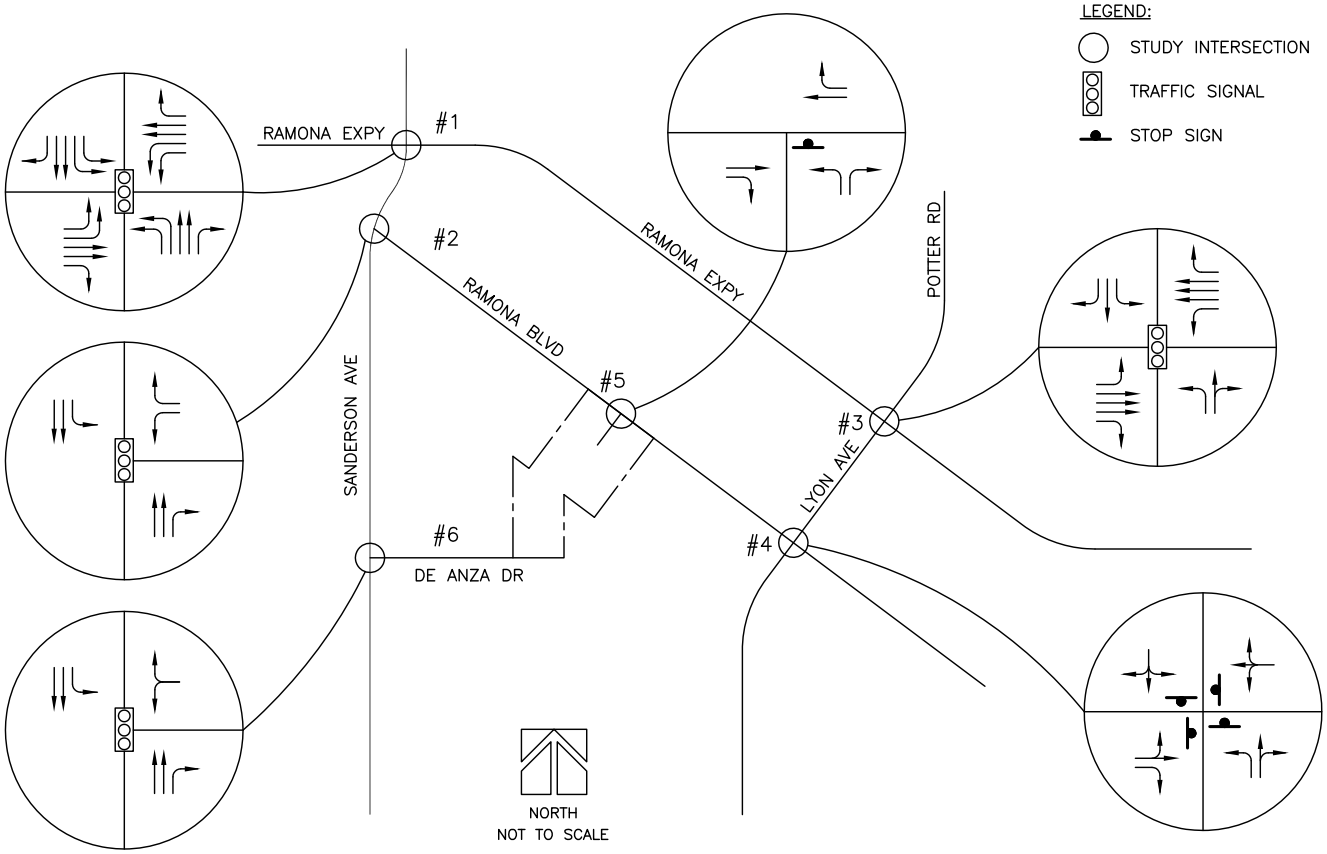
The levels of service and approach delays for the study intersections under opening year plus project conditions are shown in **Table 9**. All study intersections remain operating at acceptable LOS D or better except for the following intersections:

- Sanderson Avenue at Ramona Expressway (#1): LOS F in the AM peak hour and LOS E in the PM peak hour

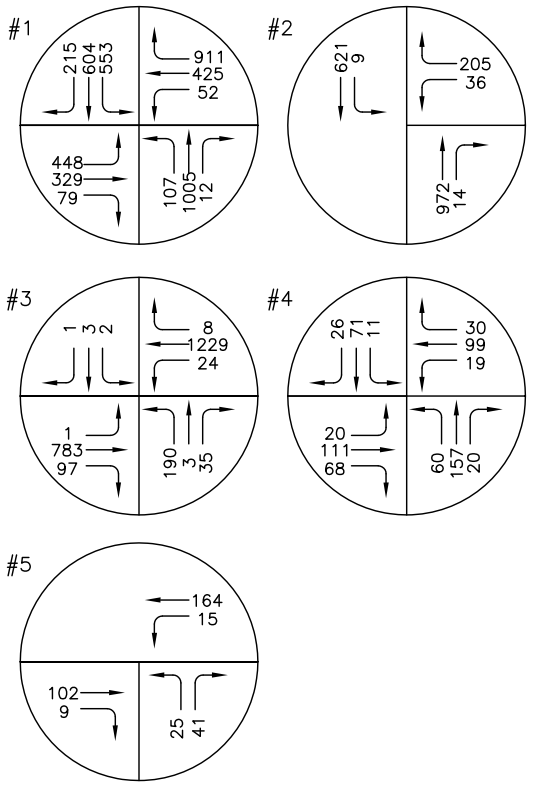
Table 7. Year 2027 plus Project

Intersection	Control Type	AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
1. Sanderson Ave at Ramona Expy	TS	F	107.6	E	73.7
2. Sanderson Ave at Ramona Blvd	TS	B	12.3	B	19.3
3. Lyon Ave at Ramona Expy	TS	C	28.9	D	35.2
4. Lyon Ave at Ramona Blvd	AWSC	B	10.4	B	12.2
5. "A St" at Ramona Blvd	TWSC	A	9.9	B	12.8

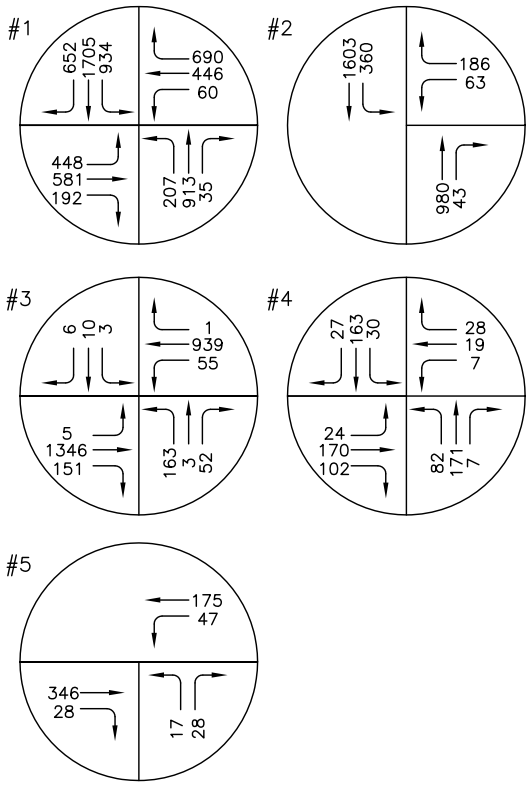
Note: TS = Traffic Signal; AWSC = All-way-stop control; TWSC = Two-way-stop control; Delay in seconds



AM PEAK HOUR



PM PEAK HOUR



YEAR 2027 BASELINE PLUS PROJECT

EXHIBIT 10

OPENING YEAR WITHOUT PROJECT

For expected opening year of 2028 upon project's full completion, the baseline traffic volumes are illustrated in **Exhibit 11**. Analysis worksheets for this scenario are provided in **Appendix C**.

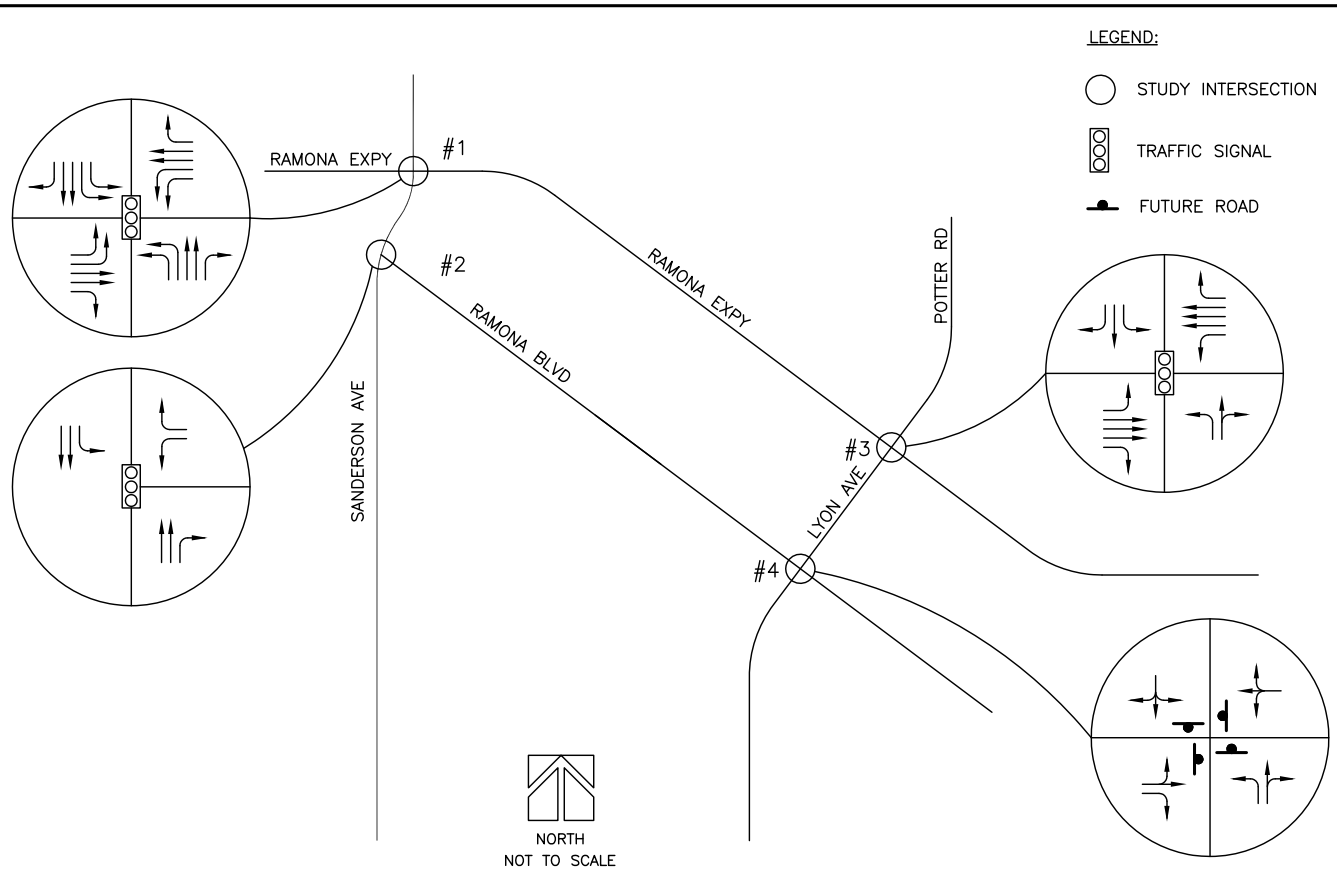
The levels of service in the AM and PM peak hour for this scenario are shown in **Table 8**. The analysis worksheets can be found in **Appendix C**. All study intersections will operate at LOS D or better except for the following intersection:

- Sanderson Avenue at Ramona Expressway (#1): LOS F in the AM peak hour

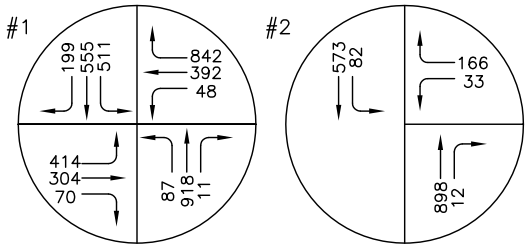
Table 8. Opening Year (2028) without Project

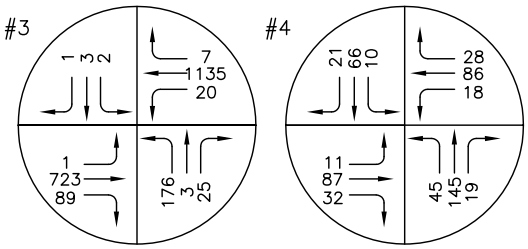
Intersection	Control Type	AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
1. Sanderson Ave at Ramona Expy	TS	F	110.8	E	77.9
2. Sanderson Ave at Ramona Blvd	TS	B	12.7	B	19.9
3. Lyon Ave/Potter Rd at Ramona Expy	TS	C	30.3	D	38.6
4. Lyon Ave at Ramona Blvd	AWSC	B	10.1	B	12.5

Note: TS = Traffic Signal; AWSC = All-way-stop control; TWSC = Two-way-stop control; Delay in seconds

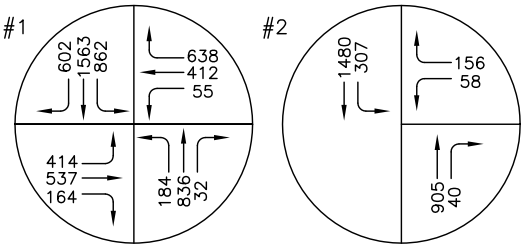


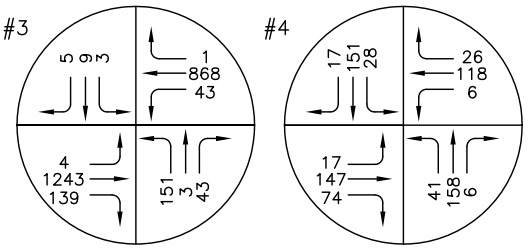
AM PEAK HOUR





PM PEAK HOUR





OPENING YEAR WITHOUT PROJECT
EXHIBIT 11

OPENING YEAR PLUS PROJECT

Traffic volumes for the project opening year (2028) plus project traffic are illustrated in **Exhibit 12**. Analysis worksheets for this scenario are provided in **Appendix C**.

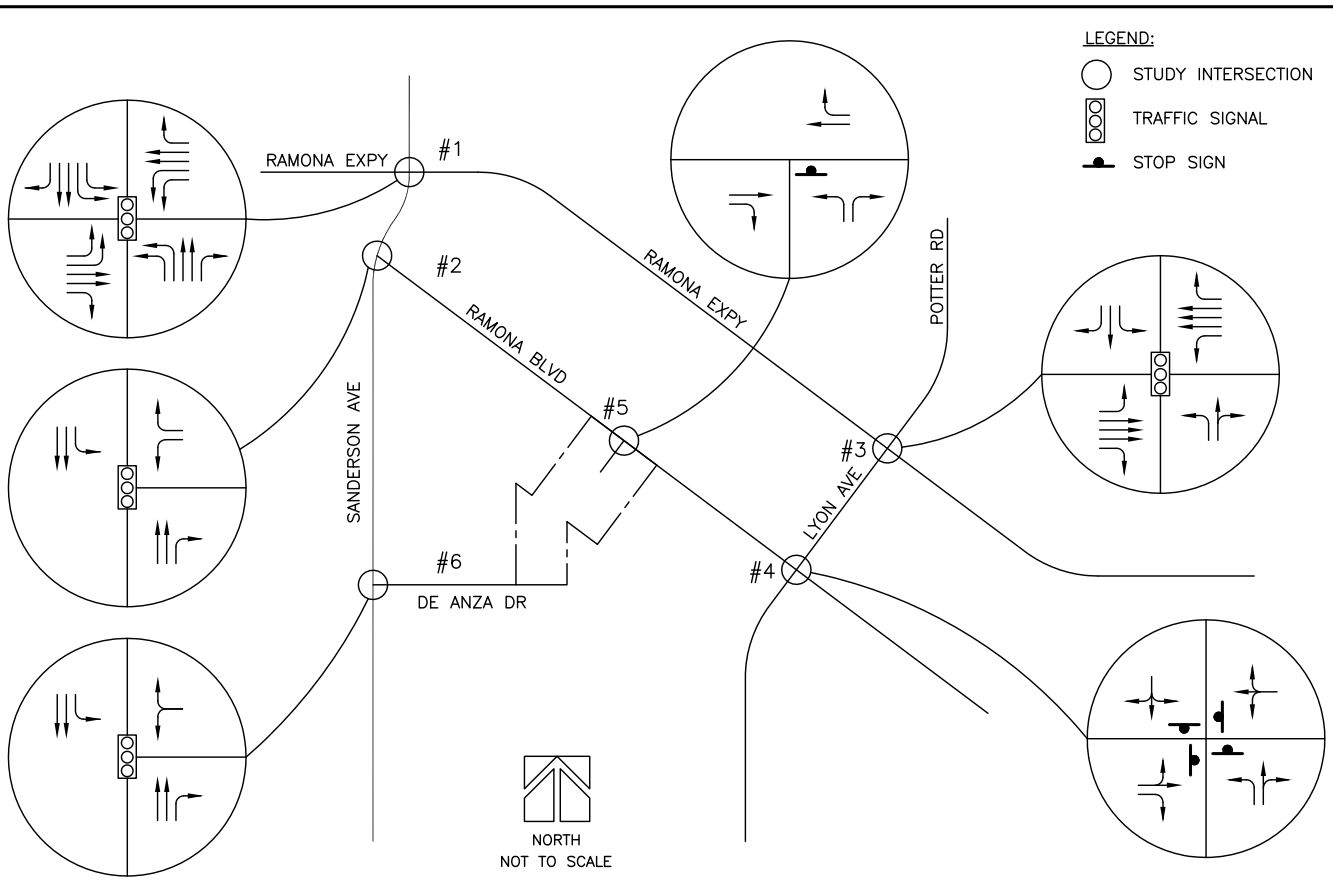
The levels of service and approach delays for the study intersections under opening year plus project conditions are shown in **Table 9**. All study intersections remain operating at acceptable LOS D or better except for the following intersections:

- Sanderson Avenue at Ramona Expressway (#1): LOS F in the AM peak hour and LOS E in the PM peak hour

Table 9. Opening Year (2023) plus Project

Intersection	Control Type	AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
1. Sanderson Ave at Ramona Expy	TS	F	111.4	F	80.1
2. Sanderson Ave at Ramona Blvd	TS	B	15.7	C	23.3
3. Lyon Ave at Ramona Expy	TS	C	30.3	D	39.6
4. Lyon Ave at Ramona Blvd	AWSC	B	10.6	B	13.5
5. Ramona Blvd at "A St"	TWSC	A	9.8	B	12.7
6. Sanderson Ave at De Anza Dr	TS	A	2.4	A	2.4

Note: TS = Traffic Signal; AWSC = All-way-stop control; TWSC = Two-way-stop control; Delay in seconds



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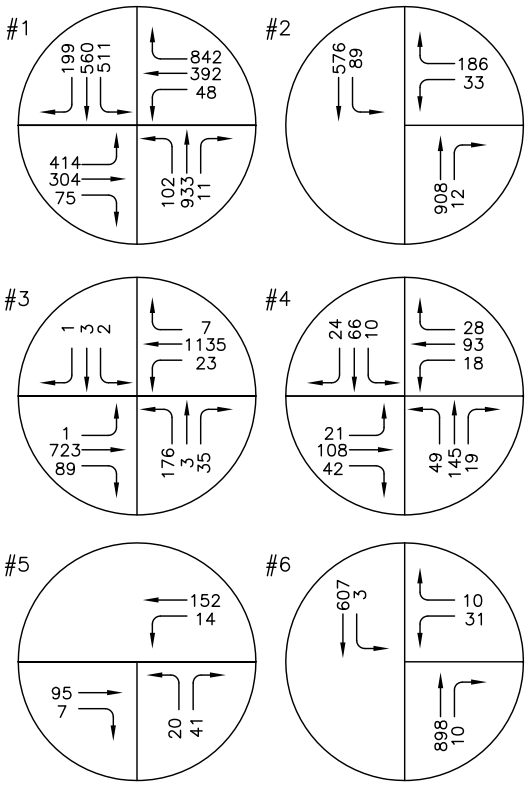
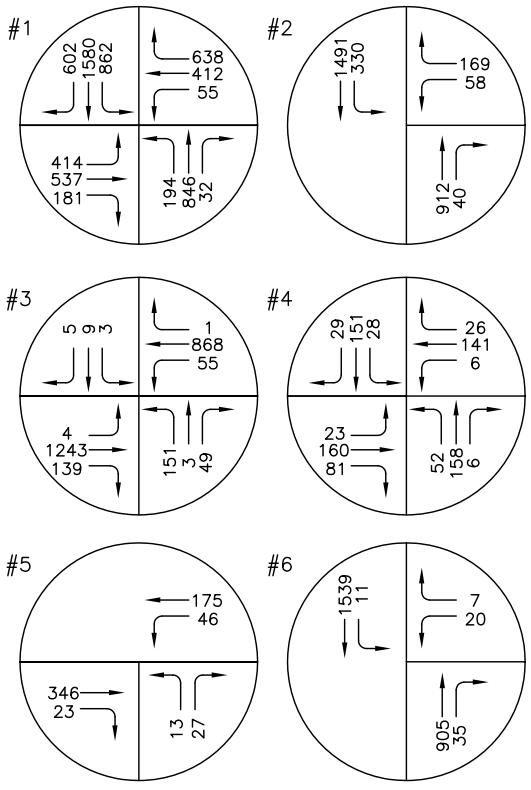


PM PEAK HOUR



OPENING YEAR PLUS PROJECT

EXHIBIT 12

GENERAL PLAN REQUIREMENT

According to the City of San Jacinto "*Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment*" and consistent with the acceptable LOS in the City's General Plan, the City considers the following criteria in signalized intersection operating requirements:

- Any signalized study intersection operating at an acceptable LOS D or better without project traffic in which the addition of project traffic causes the intersection to degrade to a LOS E or LOS F shall identify improvements to improve operations to LOS D or better.
- Any signalized intersection that is operating at LOS E or F without project traffic where the project increases delay by 5.0 or more seconds shall identify improvements to offset the increase in delay.

The City considers the following unsignalized intersection criteria when identifying operational deficiencies:

- An operational improvement would be required if either section a) or both sections b) and c) occur:
  a) The addition of project related traffic causes the intersection to degrade from an acceptable LOS D or better to LOS E or F.
     OR
  b) The project adds 5.0 seconds or more of delay to an intersection that is already projected to operate without project traffic at a LOS E or F,
     AND
  c) The intersection meets the peak hour traffic signal warrant after the addition of project traffic.

If the conditions above are satisfied, improvements should be identified that achieve the following:

- LOS D or better for case a) or to pre-project LOS and delay for case b)

For the year of 2027 with 158 units completed, project traffic does not cause any operational deficiency at study intersections, as shown in **Table 10**. Therefore, local improvements are not required.

Table 10. Operational Deficiency Analysis – Year 2027

Intersection	Control Type	Without Project		With Project			Delay Increase Limit	Operational Deficiency
		LOS	Delay	LOS	Delay	Target LOS D		
AM Peak Hour								
1. Sanderson Ave at Ramona Expy	TS	F	107.6	F	108.0	-	0.4 (<5, OK)	No
2. Sanderson Ave at Ramona Blvd	TS	B	12.3	B	12.3	OK	-	No
3. Lyon Ave/Potter Rd at Ramona Expy	TS	C	28.9	C	28.9	OK	-	No
4. Lyon Ave at Ramona Blvd	AWSC	A	10.0	B	10.4	OK	-	No
5. Ramona Blvd at "A St"	TWSC	-	-	A	9.9	OK	-	No
PM Peak Hour								
1. Sanderson Ave at Ramona Expy	TS	E	72.1	E	73.7	-	1.0 (<5, OK)	No
2. Sanderson Ave at Ramona Blvd	TS	B	19.3	B	19.3	OK	-	No
3. Lyon Ave at Ramona Expy	TS	D	35.2	D	35.2	OK	-	No
4. Lyon Ave at Ramona Blvd	AWSC	B	12.2	B	12.2	OK	-	No
5. Ramona Blvd at "A St"	TWSC	-	-	B	12.8	OK	-	No

Note: TS = Traffic Signal; AWSC = All-way-stop control; Delay in seconds

At the project opening year of 2028, project traffic does not cause any operational deficiency at study intersections, as shown in **Table 11**. Therefore, local improvements are not required.

Table 11. Operational Deficiency Analysis – Opening Year (2023)

Intersection	Control Type	Without Project		With Project			Delay Increase	Operational Deficiency
		LOS	Delay	LOS	Delay	Target LOS D		
AM Peak Hour								
1. Sanderson Ave at Ramona Expy	TS	**F**	110.8	**F**	111.4	-	**0.5 (<5, OK)**	No
2. Sanderson Ave at Ramona Blvd	TS	B	12.7	B	15.7	OK	-	No
3. Lyon Ave/Potter Rd at Ramona Expy	TS	C	30.3	C	30.3	OK	-	No
4. Lyon Ave at Ramona Blvd	AWSC	B	10.1	B	10.6	OK	-	No
5. Ramona Blvd at "A St"	TWSC	-	-	A	9.8	OK	-	No
6. Sanderson Ave at De Anza Dr	TS	-	-	A	2.4	OK	-	No
PM Peak Hour								
1. Sanderson Ave at Ramona Expy	TS	**E**	77.9	**F**	80.1	-	**2.2 (<5, OK)**	No
2. Sanderson Ave at Ramona Blvd	TS	B	19.9	C	23.3	OK	-	No
3. Lyon Ave/Potter Rd at Ramona Expy	TS	D	38.6	D	39.6	OK	-	No
4. Lyon Ave at Ramona Blvd	AWSC	B	12.5	B	13.5	OK	-	No
5. Ramona Blvd at "A St"	TWSC	-	-	B	12.7	OK	-	No
6. Sanderson Ave at De Anza Dr	TS	-	-	A	2.4	OK	-	No

Note: TS = Traffic Signal; AWSC = All-way-stop control; Delay in seconds

The study found that the intersection of Ramona Expressway and Sanderson Avenue has been operating at LOS F in the AM peak hour for existing conditions as well as the project opening year. However, the project's contribution to the pre-existing operational deficiency is negligible and local improvements are not required, according to City's local traffic assessment guidelines.

SITE ACCESS

The main entrance is provided on Ramona Boulevard by the proposed residential street temporarily named "A Street", which will be the main entrance to the project site. An exclusive westbound right-turn pocket and an exclusive westbound left-turn pocket will be provided on Ramona Boulevard. This access will be controlled by a STOP sign posted on "A Street".

The second access will be provided to Ramona Boulevard via Ranch View Lane and "F" Street. The third access point will be provided by "J" Street/De Anza Drive to provide a westerly connection to Sanderson Avenue. "J" Street/De Anza Drive will provide one lane in each direction with a pavement width of 26 feet. The intersection of De Anza Drive and Sanderson Avenue will be controlled by traffic signals. Upon project completion, De Anza Drive will serve as a Collector for the subject community solely until future developments progress in the surrounding area.

The subject segment of De Anza Drive is anticipated to carry 40% of the site's total trip generation (1,737 daily trips), roughly equivalent to average daily traffic (ADT) of 700 trips. According to the Circulation Element of General Plan, the maximum roadway capacity of Collector is 13,000 ADT trips of two-way traffic. As shown in **Table 12**, the subject roadway segment of De Anza Drive east of Sanderson Avenue will operate at 5.4% of the roadway capacity and maintain LOS A.

Table 12. Roadway Segment Analysis

Roadway Segment	# of Lanes	Capacity	ADT	V/C	LOS
De Anza Dr (Collector) east of Sanderson Ave	2	13,000	700	0.054	A

APPENDIX A
SCOPING AGREEMENT

Project Scoping Form

This scoping form shall be submitted to the City of San Jacinto to assist in identifying infrastructure improvements that may be required to support traffic from the proposed project.

Project Identification:

Case Number:	
Related Cases:	
SP No.	
EIR No.	
GPA No.	
CZ No.	
Project Name:	Valle Reseda
Project Address:	N. Ramona Blvd, San Jacinto
Project Opening Year:	2023
Project Description:	Proposed 184-unit single family residence

	Consultant:	**Developer:**
Name:	K2 Traffic Engineering, Inc.	Golden Ocean Realty, LLC
Address:	1442 Irvine Blvd, Suite 210	608 Deodar Lane
	Tustin, CA 92780	Bradbury, CA 91008
Telephone:	714-832-2116	951-741-6888
Fax/Email:	kay@k2traffic.com	zhongyuli24680@gmail.com

Trip Generation Information:

Trip Generation Data Source: ITE's Trip Generation, 10th Edition

Current General Plan Land Use:

Mediun Density Residential (MDR) and Medium-High Dennsity Residential (MHDR)

Proposed General Plan Land Use:

Median Density Residential (MDR)

Current Zoning:

Residential Median Density (RM) and Residential Low Density (RL)

Proposed Zoning:

Residential Low Density (RL)

	Existing Trip Generation			Proposed Trip Generation		
	In	Out	Total	In	Out	Total
AM Trips	0	0	0	34	102	136
PM Trips	0	0	0	115	67	182

See Exhibit 2

Trip Internalization: ☐ Yes ☒ No (__0__% Trip Discount)

Pass-By Allowance: ☐ Yes ☒ No (__0__% Trip Discount)

Potential Screening Checks

Is your project screened from specific analyses (see Page 8 of the guidelines related to LOS assessment and Page 9 related to VMT).

Is the project screened from LOS assessment? ☐ Yes ☒ No

LOS screening justification (see Page 8 of the guidelines): Not Applicable

Is the project screened from VMT assessment? ☒ Yes ☐ No

VMT screening justification (see Page 9 of the guidelines): Within a low VMT generating TAZ based on Home-Based Work VMT, See Exhibit 4

Level of Service Scoping

- Proposed Trip Distribution (Attach Graphic for Detailed Distribution): See Exhibit 3

North	South	East	West
15 %	40 %	30 %	15 %

- Attach list of Approved and Pending Projects that need to be considered (provided by the lead agency and adjacent agencies)
- Attach list of study intersections/roadway segments See Exhibit 5
- Attach site plan See Exhibit 1
- Note other specific items to be addressed:
  - Site access
  - On-site circulation
  - ~~Parking~~
  - ~~Consistency with Plans supporting Bikes/Peds/Transit~~
  - Other _____
- Date of Traffic Counts New counts
- Attach proposed analysis scenarios (years plus proposed forecasting approach)
- Attach proposed phasing approach (if the project is phased)

VMT Scoping

For projects that are not screened, identify the following:

- Travel Demand Forecasting Model Used _____
- Attach WRCOG Screening VMT Assessment output or describe why it is not appropriate for use
- Attach proposed Model Land Use Inputs and Assumed Conversion Factors (attach)

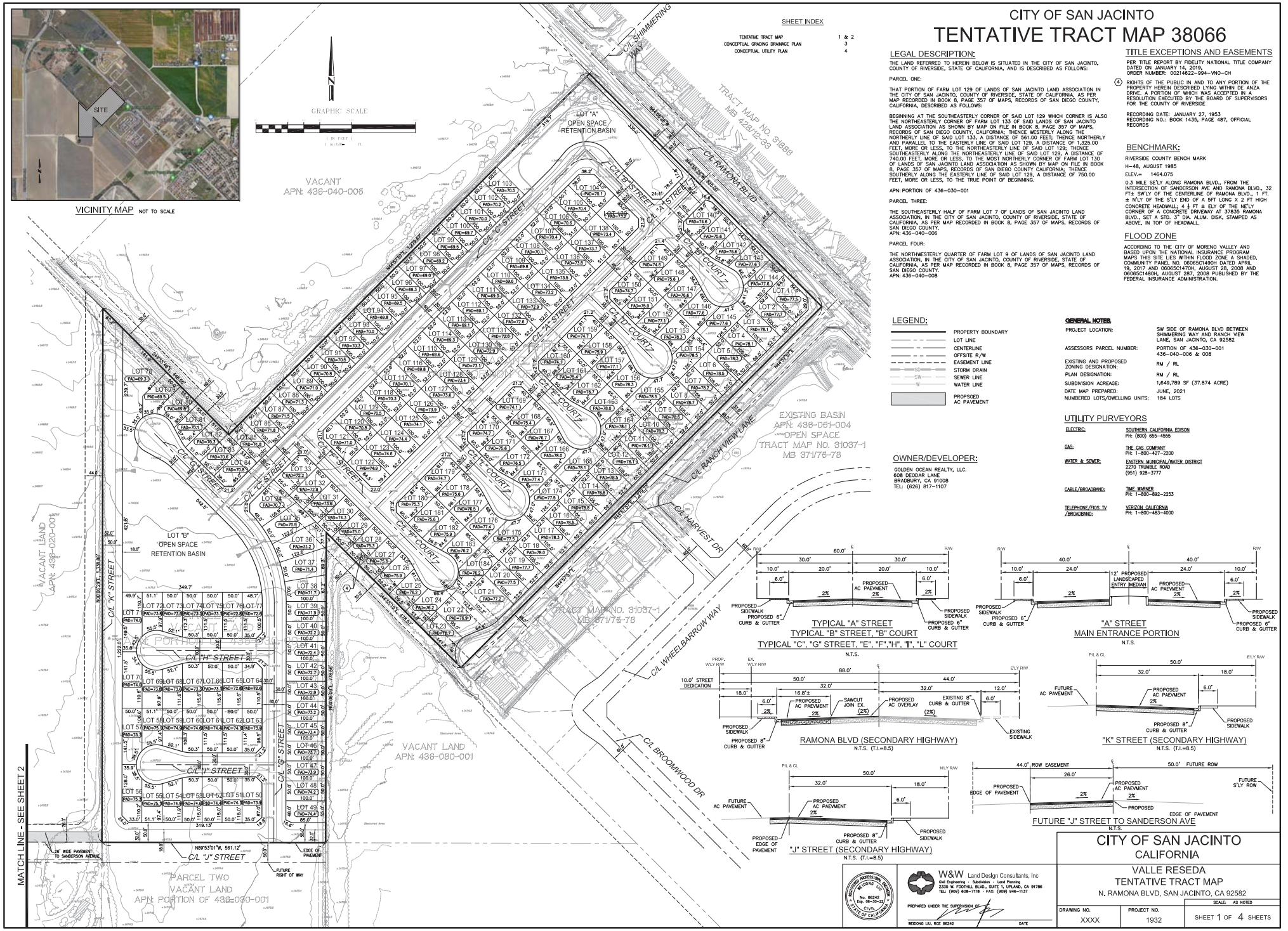
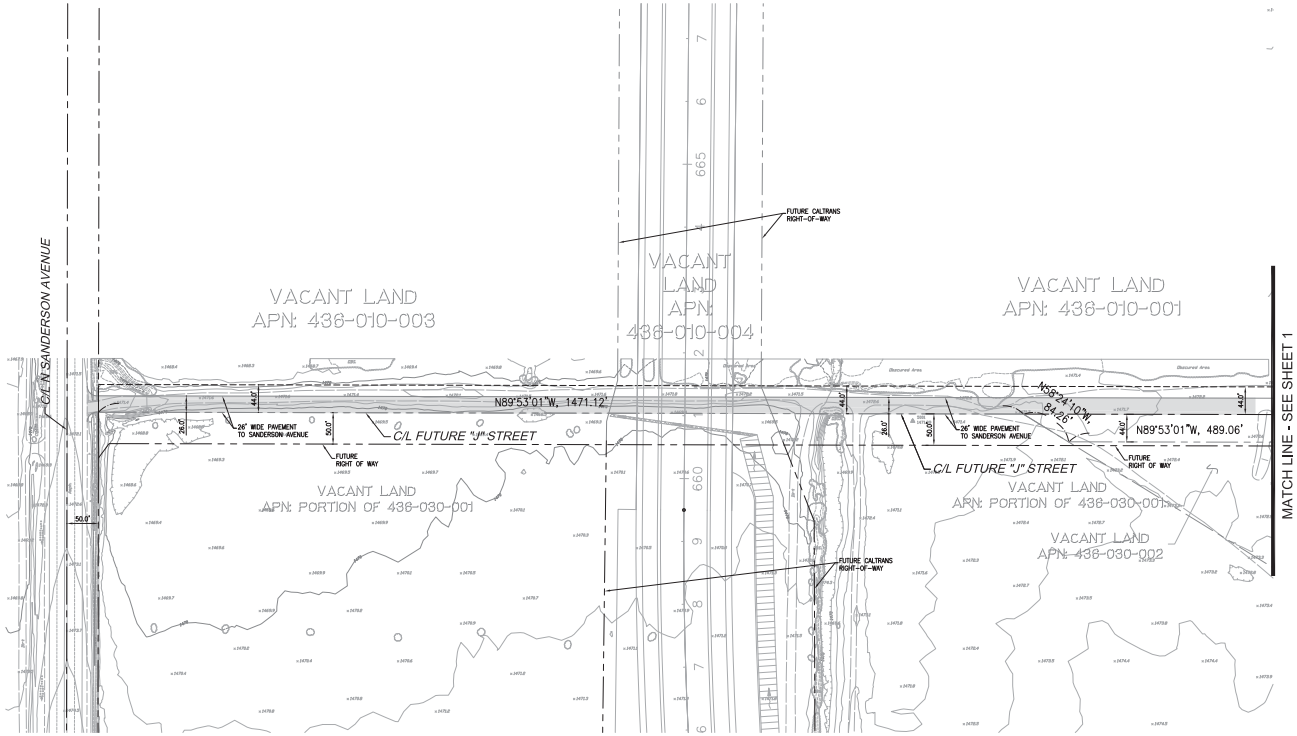
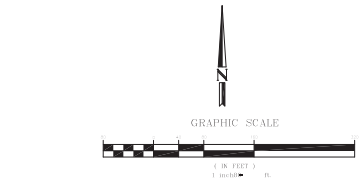


EXHIBIT 1-1. PROPOSED SITE PLAN

CITY OF SAN JACINTO

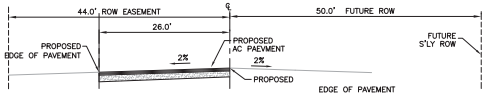
TENTATIVE TRACT MAP 38066





LEGEND:

- PROPERTY BOUNDARY
- LOT LINE
- CENTERLINE
- OFFSITE R/W
- EASEMENT LINE
- SD STORM DRAIN
- SW SEWER LINE
- W WATER LINE
- PROPSOED AC PAVEMENT



FUTURE "J" STREET TO SANDERSON AVE
N.T.S.

LOT AREA TABLE

LOT NO.	LOT AREA (SF)	LOT NO.	LOT AREA (SF)	LOT NO.	LOT AREA (SF)	LOT NO.	LOT AREA (SF)	LOT NO.	LOT AREA (SF)	LOT NO.	LOT AREA (SF)	LOT NO.	LOT AREA (SF)	LOT NO.	LOT AREA (SF)
1	6,511	27	5,000	53	5,724	79	5,275	105	5,070	131	5,200	157	5,029	183	5,068
2	5,460	28	5,000	54	5,232	80	5,146	106	5,100	132	5,200	158	5,005	184	6,555
3	5,460	29	5,000	55	5,036	81	5,105	107	5,200	133	5,200	159	5,180		
4	5,460	30	5,000	56	6,767	82	5,196	108	5,200	134	5,200	160	5,178		
5	5,460	31	5,000	57	6,735	83	5,000	109	5,200	135	5,200	161	5,002		
6	5,460	32	5,000	58	4,853	84	5,186	110	5,200	136	5,200	162	5,022		
7	5,460	33	5,388	59	5,055	85	5,000	111	5,200	137	5,070	163	5,079		
8	5,460	34	7,136	60	5,573	86	5,000	112	5,200	138	5,100	164	6,519		
9	5,460	35	6,638	61	5,573	87	5,000	113	5,200	139	6,137	165	6,536		
10	5,460	36	7,692	62	5,573	88	5,000	114	5,200	140	5,185	166	5,085		
11	5,460	37	6,639	63	5,460	89	5,000	115	5,200	141	5,049	167	5,014		
12	6,300	38	5,970	64	5,664	90	5,000	116	5,200	142	5,060	168	5,014		
13	5,513	39	5,000	65	5,777	91	5,000	117	5,200	143	5,167	169	5,181		
14	5,513	40	5,000	66	5,777	92	5,000	118	5,200	144	6,351	170	5,173		
15	5,513	41	5,000	67	5,752	93	5,000	119	5,200	145	6,557	171	5,005		
16	5,513	42	5,000	68	5,261	94	5,000	120	5,200	146	5,033	172	5,000		
17	5,513	43	5,000	69	5,060	95	5,000	121	5,389	147	5,027	173	5,074		
18	5,513	44	5,000	70	6,792	96	5,000	122	5,379	148	5,002	174	6,535		
19	5,513	45	5,000	71	7,065	97	5,000	123	5,200	149	5,177	175	6,557		
20	5,513	46	5,000	72	5,060	98	5,000	124	5,200	150	5,186	176	9,129		
21	7,909	47	5,000	73	5,775	99	5,000	125	5,200	151	5,009	177	5,022		
22	8,204	48	5,000	74	5,775	100	5,000	126	5,200	152	5,035	178	5,020		
23	5,716	49	5,448	75	5,775	101	5,000	127	5,200	153	5,041	179	5,185		
24	5,636	50	5,540	76	5,775	102	5,000	128	5,200	154	6,554	180	5,174		
25	5,006	51	5,750	77	5,658	103	5,000	129	5,200	155	6,517	181	5,006		
26	5,075	52	5,750	78	14,338	104	6,134	130	5,200	156	5,083	182	5,003		
OPEN SPACE "A"		88,259		OPEN SPACE "B"		56,848									

REGISTERED PROFESSIONAL ENGINEER
ALDONG LIU
No. 66242
Exp. 06-30-22
CIVIL
STATE OF CALIFORNIA

W&W Land Design Consultants, Inc
Civil Engineering · Subdivision · Land Planning
2335 W. FOOTHILL BLVD., SUITE 1, UPLAND, CA 91786
TEL: (909) 608-7118 · FAX: (909) 946-1137

PREPARED UNDER THE SUPERVISION OF:

ALDONG LIU, RCE 66242 DATE

CITY OF SAN JACINTO
CALIFORNIA

VALLE RESEDA
TENTATIVE TRACT MAP
N. RAMONA BLVD, SAN JACINTO, CA 92582

SCALE: AS NOTED

DRAWING NO.	PROJECT NO.	SHEET
XXXX	1932	SHEET 2 OF 4 SHEETS

\\wwserver\DATA\1932-Ave Beach Grand San Jacinto 43.61 acres\Tm\1932TM02.dwg, 6/30/2021 1:09:55 PM, Adobe PDF

EXHIBIT 1-2. PROPOSED SITE PLAN

EXHIBIT 2. TRIP GENERATION

TABLE 1. TRIP GENERATION RATE (ITE)

LAND USE	UNIT	Daily	AM Peak			PM Peak		
			Total	IN	OUT	Total	IN	OUT
Single-Family Detached Housing (210)	Dwelling Units	9.44	0.74	25%	75%	0.99	63%	37%

Note: Fitted Curve Equation: Ln(T)=0.74 Ln(X)+2.89; X=1000 Sq. Ft. GFA

Source: Trip Generation Manual, 10th Edition

TABLE 2. TRIP GENERATION

LAND USE	UNIT	Quantity	AM Peak			PM Peak			Daily
			Total	IN	OUT	Total	IN	OUT	
Single-Family Detached Housing (210)	Dwelling Units	184	136	34	102	182	115	67	1,737

EXHIBIT 3. TRIP DISTRIBUTION

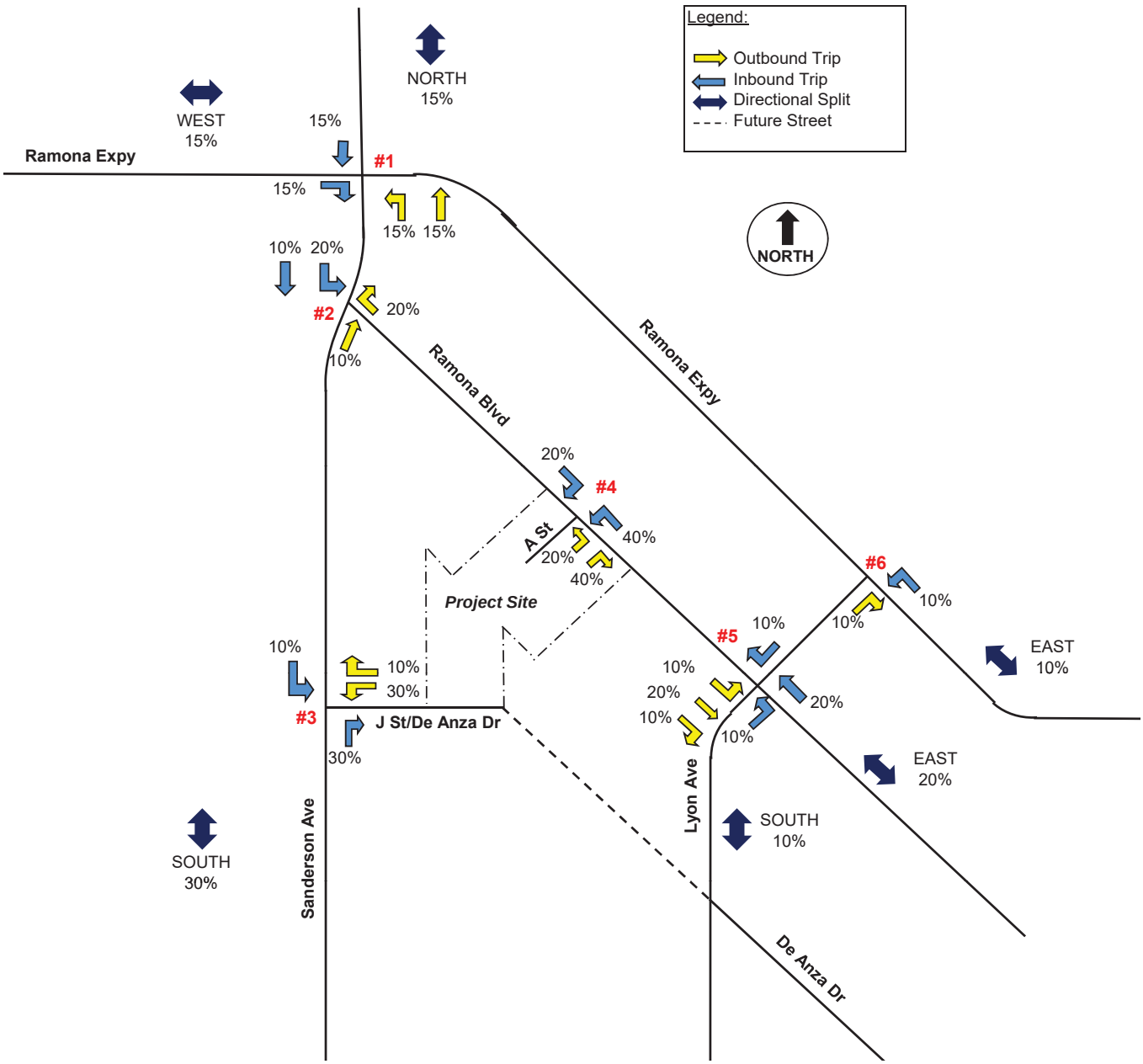


EXHIBIT 4. VMT SCREENING – RIVTAM MODEL

APN:436040006; TAZ:4,209

Within a Transit Priority Area (TPA)?
No (Fail)

Within a low VMT generating TAZ based on Total VMT?
No (Fail)
Jurisdictional average 2012 daily total VMT per service population = 28.88
Project TAZ 2012 daily total VMT per service population = 57.84

Within a low VMT generating TAZ based on Residential Home-Based VMT?
No (Fail)
Jurisdictional average 2012 daily residential home-based VMT per capita = 14.49
Project TAZ 2012 daily residential home-based VMT per capita = 23.59

Within a low VMT generating TAZ based on Home-Based Work VMT?
Yes (Pass)
Jurisdictional average 2012 daily home-based work VMT per worker = 7.59
Project TAZ 2012 daily home-based work VMT per worker = 4.43

APN:436040008; TAZ:4,209

Within a Transit Priority Area (TPA)?
No (Fail)

Within a low VMT generating TAZ based on Total VMT?
No (Fail)
Jurisdictional average 2012 daily total VMT per service population = 28.88
Project TAZ 2012 daily total VMT per service population = 57.84

Within a low VMT generating TAZ based on Residential Home-Based VMT?
No (Fail)
Jurisdictional average 2012 daily residential home-based VMT per capita = 14.49
Project TAZ 2012 daily residential home-based VMT per capita = 23.59

Within a low VMT generating TAZ based on Home-Based Work VMT?
Yes (Pass)
Jurisdictional average 2012 daily home-based work VMT per worker = 7.59
Project TAZ 2012 daily home-based work VMT per worker = 4.43

APN:436030001; TAZ:4,209

Within a Transit Priority Area (TPA)?
No (Fail)

Within a low VMT generating TAZ based on Total VMT?
No (Fail)
Jurisdictional average 2012 daily total VMT per service population = 28.88
Project TAZ 2012 daily total VMT per service population = 57.84

Within a low VMT generating TAZ based on Residential Home-Based VMT?
No (Fail)
Jurisdictional average 2012 daily residential home-based VMT per capita = 14.49
Project TAZ 2012 daily residential home-based VMT per capita = 23.59

Within a low VMT generating TAZ based on Home-Based Work VMT?
Yes (Pass)
Jurisdictional average 2012 daily home-based work VMT per worker = 7.59
Project TAZ 2012 daily home-based work VMT per worker = 4.43

Notes:

- TPA designation is based on October 2018 conditions.
- Screening results are based on location of parcel centroids. If results are desired considering the full parcel, please refer to the associated map layers to visually review parcel and TAZ boundary relationship.
- If VMT screening is desired for current baseline conditions, contact WRCOG for 2012 and 2040 VMT data. Interpolated VMT results can be obtained using the complete data set.
- VMT results do not account for full length of trips that occur beyond the SCAG region.

EXHIBIT 5. ADDITIONAL STUDY INFORMATION

A. Study Intersections:

1. Sanderson Ave at Ramona Expy	4. Ramona Blvd at A St
2. Sanderson Ave at Ramona Blvd	5. Lyon Ave at Ramona Blvd
3. Sanderson Ave at J St / De Anza Dr	6. Lyon Ave at Ramona Expy

B. Study Scenarios: Annual Ambient Growth Rate: 2%

1 Existing Conditions
2 Existing Conditions Plus Project
3 Opening Year (2023) Without Project
4 Opening Year (2023) Plus Project
5 Opening Year (2023) Plus Project With Mitigation Measure, If Necessary

C. Phasing: Project will be constructed in one phase

APPENDIX B
TURNING MOVEMENT COUNT DATA

INTERSECTION TURNING MOVEMENT COUNTS

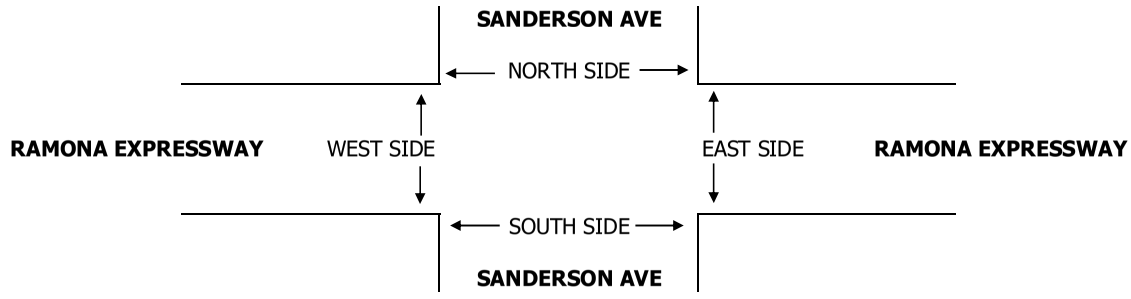
PREPARED BY: PACIFIC TRAFFIC DATA SERVICES

DATE:	LOCATION:	SAN JACINTO	PROJECT #:	
7/29/21	NORTH & SOUTH:	SANDERSON AVE	LOCATION #:	1
THURSDAY	EAST & WEST:	RAMONA EXPRESSWAY	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND SANDERSON AVE			SOUTHBOUND SANDERSON AVE			EASTBOUND RAMONA EXPRESSWAY			WESTBOUND RAMONA EXPRESSWAY			
	LANES:	NL 2	NT 2	NR 1	SL 2	ST 2	SR 1	EL 2	ET 2	ER 1	WL 2	WT 2	WR 1	TOTAL
AM	7:00 AM	18	214	3	105	136	51	81	74	15	10	94	193	994
	7:15 AM	24	200	2	123	114	53	104	93	17	11	106	211	1,058
	7:30 AM	27	227	2	117	118	45	111	70	17	18	91	214	1,057
	7:45 AM	15	241	4	146	165	42	102	55	18	7	86	191	1,072
	8:00 AM	22	216	1	96	129	53	89	65	14	5	71	174	935
	8:15 AM	26	231	1	107	123	45	88	74	10	4	82	193	984
	8:30 AM	11	238	5	110	120	52	81	70	8	2	86	149	932
	8:45 AM	23	145	4	144	105	73	60	54	15	7	88	124	842
	VOLUMES	166	1,712	22	948	1,010	414	716	555	114	64	704	1,449	7,874
	APPROACH %	9%	90%	1%	40%	43%	17%	52%	40%	8%	3%	32%	65%	
	APP/DEPART	1,900	/	3,877	2,372	/	1,188	1,385	/	1,525	2,217	/	1,284	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	84	882	11	491	533	191	398	292	67	46	377	809	4,181
	APPROACH %	9%	90%	1%	40%	44%	16%	53%	39%	9%	4%	31%	66%	
	PEAK HR FACTOR		0.939			0.860			0.884			0.939		0.975
	APP/DEPART	977	/	2,089	1,215	/	646	757	/	794	1,232	/	652	0
PM	4:00 PM	24	178	4	214	352	140	109	170	48	9	100	141	1,489
	4:15 PM	18	122	11	177	301	115	103	161	33	7	95	169	1,312
	4:30 PM	31	224	10	221	382	122	84	113	28	8	76	131	1,430
	4:45 PM	31	187	12	215	342	152	87	148	43	11	80	140	1,448
	5:00 PM	60	187	6	212	369	133	127	118	30	19	116	155	1,532
	5:15 PM	60	220	11	193	411	131	71	105	49	7	106	152	1,516
	5:30 PM	26	210	2	209	380	163	113	145	36	16	94	166	1,560
	5:45 PM	35	199	5	236	367	131	61	143	33	6	91	123	1,430
	VOLUMES	285	1,527	61	1,677	2,904	1,087	755	1,103	300	83	758	1,177	11,717
	APPROACH %	15%	82%	3%	30%	51%	19%	35%	51%	14%	4%	38%	58%	
	APP/DEPART	1,873	/	3,459	5,668	/	3,287	2,158	/	2,841	2,018	/	2,130	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	177	804	31	829	1,502	579	398	516	158	53	396	613	6,056
	APPROACH %	17%	79%	3%	28%	52%	20%	37%	48%	15%	5%	37%	58%	
	PEAK HR FACTOR		0.869			0.967			0.912			0.916		0.971
	APP/DEPART	1,012	/	1,815	2,910	/	1,713	1,072	/	1,376	1,062	/	1,152	0



INTERSECTION TURNING MOVEMENT COUNTS

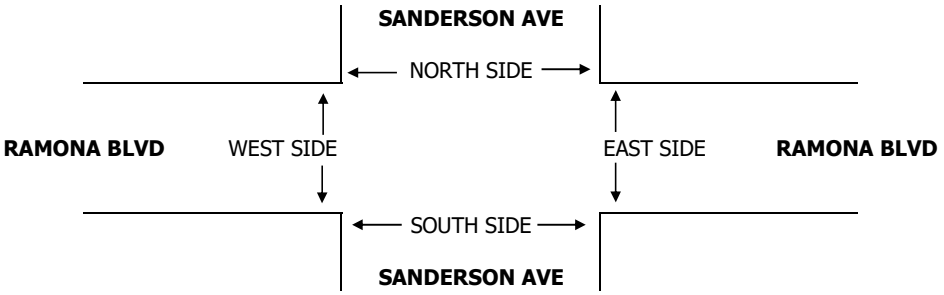
PREPARED BY: PACIFIC TRAFFIC DATA SERVICES

DATE:	LOCATION:	SAN JACINTO	PROJECT #:	
7/29/21	NORTH & SOUTH:	SANDERSON AVE	LOCATION #:	2
THURSDAY	EAST & WEST:	RAMONA BLVD	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND SANDERSON AVE			SOUTHBOUND SANDERSON AVE			EASTBOUND RAMONA BLVD			WESTBOUND RAMONA BLVD			
	LANES:	NL X	NT 2	NR 1	SL 1	ST 2	SR X	EL X	ET X	ER X	WL 1	WT X	WR 1	TOTAL
AM	7:00 AM		208	5	19	143					5		21	401
	7:15 AM		199	6	22	126					6		25	384
	7:30 AM		201	6	19	132					4		56	418
	7:45 AM		223	1	24	164					12		39	463
	8:00 AM		223	3	18	135					10		22	411
	8:15 AM		216	2	18	120					6		43	405
	8:30 AM		223	1	17	115					7		30	393
	8:45 AM		148	5	12	112					10		34	321
	VOLUMES	0	1,641	29	149	1,047	0	0	0	0	60	0	270	3,196
	APPROACH %	0%	98%	2%	12%	88%	0%	0%	0%	0%	18%	0%	82%	
	APP/DEPART	1,670	/	1,911	1,196	/	1,107	0	/	178	330	/	0	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	0	863	12	79	551	0	0	0	0	32	0	160	1,697
	APPROACH %	0%	99%	1%	13%	87%	0%	0%	0%	0%	17%	0%	83%	
	PEAK HR FACTOR		0.968			0.838			0.000			0.800		0.916
	APP/DEPART	875	/	1,023	630	/	583	0	/	91	192	/	0	0
PM	4:00 PM		182	8	56	351					10		21	628
	4:15 PM		136	6	62	282					5		27	518
	4:30 PM		234	8	68	346					9		26	691
	4:45 PM		204	5	51	347					5		23	635
	5:00 PM		226	10	69	352					7		29	693
	5:15 PM		251	5	61	399					15		32	763
	5:30 PM		187	14	94	334					25		58	712
	5:45 PM		206	9	71	338					9		31	664
	VOLUMES	0	1,626	65	532	2,749	0	0	0	0	85	0	247	5,304
	APPROACH %	0%	96%	4%	16%	84%	0%	0%	0%	0%	26%	0%	74%	
	APP/DEPART	1,691	/	1,873	3,281	/	2,834	0	/	597	332	/	0	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	0	870	38	295	1,423	0	0	0	0	56	0	150	2,832
	APPROACH %	0%	96%	4%	17%	83%	0%	0%	0%	0%	27%	0%	73%	
	PEAK HR FACTOR		0.887			0.934			0.000			0.620		0.928
	APP/DEPART	908	/	1,020	1,718	/	1,479	0	/	333	206	/	0	0



INTERSECTION TURNING MOVEMENT COUNTS

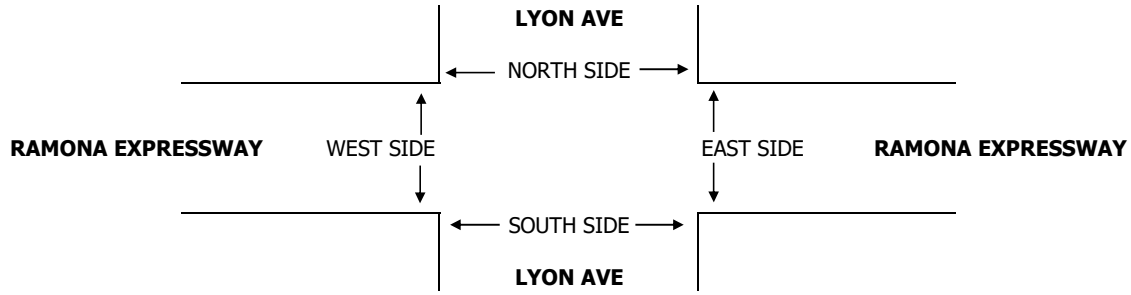
PREPARED BY: PACIFIC TRAFFIC DATA SERVICES

DATE:	LOCATION:	SAN JACINTO	PROJECT #:	
7/29/21	NORTH & SOUTH:	LYON AVE	LOCATION #:	3
THURSDAY	EAST & WEST:	RAMONA EXPRESSWAY	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND LYON AVE			SOUTHBOUND LYON AVE			EASTBOUND RAMONA EXPRESSWAY			WESTBOUND RAMONA EXPRESSWAY			
	LANES:	NL 1	NT 1	NR 0	SL 1	ST 2	SR 0	EL 1	ET 3	ER 1	WL 1	WT 3	WR 1	TOTAL
AM	7:00 AM	42	0	3	0	1	0	0	173	21	5	286	2	533
	7:15 AM	45	1	3	1	1	0	0	178	25	4	304	1	563
	7:30 AM	37	0	7	1	0	1	0	163	22	4	269	3	507
	7:45 AM	45	2	11	0	1	0	1	181	18	6	232	1	498
	8:00 AM	39	0	5	2	0	1	2	133	15	5	199	1	402
	8:15 AM	32	2	5	0	1	2	0	167	24	6	246	1	486
	8:30 AM	39	4	4	1	0	3	0	178	17	2	188	1	437
	8:45 AM	39	1	7	1	1	3	1	173	18	2	203	2	451
	VOLUMES	318	10	45	6	5	10	4	1,346	160	34	1,927	12	3,877
	APPROACH %	85%	3%	12%	29%	24%	48%	0%	89%	11%	2%	98%	1%	
	APP/DEPART	373	/	26	21	/	199	1,510	/	1,397	1,973	/	2,255	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	169	3	24	2	3	1	1	695	86	19	1,091	7	2,101
	APPROACH %	86%	2%	12%	33%	50%	17%	0%	89%	11%	2%	98%	1%	
	PEAK HR FACTOR		0.845			0.750			0.963			0.904		0.933
	APP/DEPART	196	/	11	6	/	108	782	/	721	1,117	/	1,261	0
PM	4:00 PM	29	1	3	0	1	1	1	310	44	10	213	0	613
	4:15 PM	42	0	7	1	3	1	2	315	45	8	234	0	658
	4:30 PM	29	2	14	2	1	1	0	284	39	13	170	0	555
	4:45 PM	23	1	12	0	4	1	1	306	23	10	195	0	576
	5:00 PM	51	0	8	0	1	2	1	290	27	10	235	1	626
	5:15 PM	27	0	12	1	1	0	0	255	37	10	218	0	561
	5:30 PM	39	2	8	1	0	0	0	290	38	8	212	0	598
	5:45 PM	30	1	6	0	1	1	0	331	38	11	172	0	591
	VOLUMES	270	7	70	5	12	7	5	2,381	291	80	1,649	1	4,778
	APPROACH %	78%	2%	20%	21%	50%	29%	0%	89%	11%	5%	95%	0%	
	APP/DEPART	347	/	13	24	/	383	2,677	/	2,456	1,730	/	1,926	0
	BEGIN PEAK HR		4:15 PM											
	VOLUMES	145	3	41	3	9	5	4	1,195	134	41	834	1	2,415
	APPROACH %	77%	2%	22%	18%	53%	29%	0%	90%	10%	5%	95%	0%	
	PEAK HR FACTOR		0.801			0.850			0.921			0.890		0.918
	APP/DEPART	189	/	8	17	/	184	1,333	/	1,239	876	/	984	0



INTERSECTION TURNING MOVEMENT COUNTS

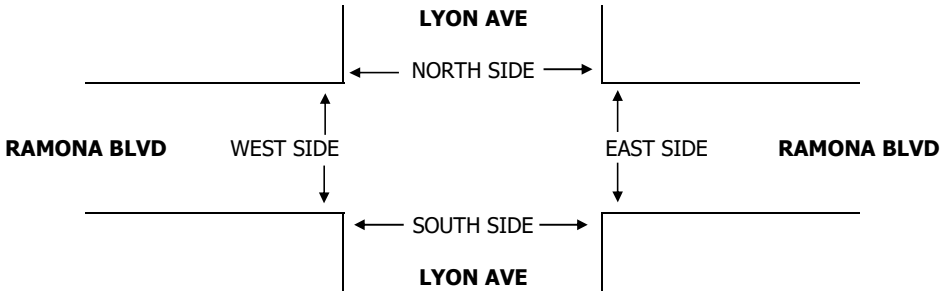
PREPARED BY: PACIFIC TRAFFIC DATA SERVICES

DATE:	LOCATION:	SAN JACINTO	PROJECT #:	
7/29/21	NORTH & SOUTH:	LYON AVE	LOCATION #:	4
THURSDAY	EAST & WEST:	RAMONA BLVD	CONTROL:	4-WAY STOP

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND LYON AVE			SOUTHBOUND LYON AVE			EASTBOUND RAMONA BLVD			WESTBOUND RAMONA BLVD			
	LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
AM	7:00 AM	10	37	1	2	22	5	7	15	1	8	15	1	124
	7:15 AM	2	41	6	1	25	3	2	24	9	11	15	2	141
	7:30 AM	4	34	8	1	23	3	5	22	3	3	24	8	138
	7:45 AM	8	43	1	3	21	4	5	17	2	3	14	8	129
	8:00 AM	8	35	0	2	14	4	5	22	6	3	24	5	128
	8:15 AM	8	35	6	2	24	6	0	22	10	6	23	4	146
	8:30 AM	12	30	8	3	12	6	4	24	7	2	18	11	137
	8:45 AM	15	39	4	3	13	4	2	16	8	6	18	7	135
	VOLUMES	67	294	34	17	154	35	30	162	46	42	151	46	1,078
	APPROACH %	17%	74%	9%	8%	75%	17%	13%	68%	19%	18%	63%	19%	
	APP/DEPART	395	/	370	206	/	242	238	/	213	239	/	253	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	43	139	18	10	63	20	11	84	31	17	83	27	546
	APPROACH %	22%	70%	9%	11%	68%	22%	9%	67%	25%	13%	65%	21%	
	PEAK HR FACTOR		0.862			0.727			0.900			0.962		0.935
	APP/DEPART	200	/	177	93	/	111	126	/	112	127	/	146	0
PM	4:00 PM	8	22	6	4	43	7	4	31	17	4	27	11	184
	4:15 PM	12	42	2	7	41	4	2	37	20	2	24	5	198
	4:30 PM	11	37	1	8	45	5	4	34	19	0	29	5	198
	4:45 PM	5	28	3	3	31	6	5	39	14	1	28	3	166
	5:00 PM	11	45	0	9	28	1	5	31	18	3	32	12	195
	5:15 PM	6	31	1	11	38	3	7	31	16	3	22	4	173
	5:30 PM	6	34	2	3	38	2	5	35	15	8	27	7	182
	5:45 PM	11	32	0	4	42	6	2	39	24	4	27	6	197
	VOLUMES	70	271	15	49	306	34	34	277	143	25	216	53	1,493
	APPROACH %	20%	76%	4%	13%	79%	9%	7%	61%	31%	9%	73%	18%	
	APP/DEPART	356	/	358	389	/	474	454	/	341	294	/	320	0
	BEGIN PEAK HR		4:15 PM											
	VOLUMES	39	152	6	27	145	16	16	141	71	6	113	25	757
	APPROACH %	20%	77%	3%	14%	77%	9%	7%	62%	31%	4%	78%	17%	
	PEAK HR FACTOR		0.879			0.810			0.966			0.766		0.956
	APP/DEPART	197	/	193	188	/	222	228	/	174	144	/	168	0

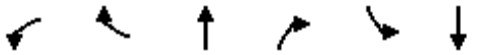


APPENDIX C
LEVEL OF SERVICE ANALYSIS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	398	292	67	46	377	809	84	882	11	491	533	191
Future Volume (veh/h)	398	292	67	46	377	809	84	882	11	491	533	191
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	433	317	73	50	410	879	91	959	12	534	579	208
Adj No. of Lanes	2	2	1	2	2	1	2	2	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	431	907	474	124	591	554	149	1267	624	629	1760	986
Arrive On Green	0.13	0.26	0.26	0.04	0.17	0.17	0.04	0.36	0.36	0.18	0.50	0.50
Sat Flow, veh/h	3442	3539	1583	3442	3539	1583	3442	3539	1583	3442	3539	1583
Grp Volume(v), veh/h	433	317	73	50	410	879	91	959	12	534	579	208
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1721	1770	1583	1721	1770	1583	1721	1770	1583
Q Serve(g_s), s	13.5	7.9	3.6	1.5	11.8	18.0	2.8	25.7	0.5	16.2	10.6	6.2
Cycle Q Clear(g_c), s	13.5	7.9	3.6	1.5	11.8	18.0	2.8	25.7	0.5	16.2	10.6	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	431	907	474	124	591	554	149	1267	624	629	1760	986
V/C Ratio(X)	1.00	0.35	0.15	0.40	0.69	1.59	0.61	0.76	0.02	0.85	0.33	0.21
Avail Cap(c_a), veh/h	431	907	474	160	591	554	220	1267	624	974	1760	986
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.1	32.7	27.7	50.8	42.3	35.0	50.7	30.5	19.9	42.6	16.3	8.8
Incr Delay (d2), s/veh	44.4	0.2	0.1	2.1	3.5	272.8	4.0	4.3	0.1	4.4	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	3.9	1.6	0.8	6.0	58.4	1.4	13.3	0.2	8.1	5.3	2.8
LnGrp Delay(d),s/veh	91.6	33.0	27.9	52.9	45.8	307.8	54.6	34.7	20.0	47.0	16.8	9.3
LnGrp LOS	F	C	C	D	D	F	D	C	B	D	B	A
Approach Vol, veh/h		823			1339			1062			1321	
Approach Delay, s/veh		63.4			218.0			36.3			27.8	
Approach LOS		E			F			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.2	43.1	8.4	32.1	9.2	58.1	18.0	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	30.5	30.0	5.0	26.5	6.9	53.6	13.5	18.0
Max Q Clear Time (g_c+I1), s	18.2	27.7	3.5	9.9	4.8	12.6	15.5	20.0
Green Ext Time (p_c), s	1.5	1.3	0.0	1.7	0.0	4.4	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	92.3
HCM 2010 LOS	F



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	32	160	863	12	79	551
Future Volume (veh/h)	32	160	863	12	79	551
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	35	174	938	13	86	599
Adj No. of Lanes	1	1	2	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	248	221	1718	768	130	2333
Arrive On Green	0.14	0.14	0.49	0.49	0.07	0.66
Sat Flow, veh/h	1774	1583	3632	1583	1774	3632
Grp Volume(v), veh/h	35	174	938	13	86	599
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1583	1774	1770
Q Serve(g_s), s	0.8	4.8	8.3	0.2	2.1	3.1
Cycle Q Clear(g_c), s	0.8	4.8	8.3	0.2	2.1	3.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	248	221	1718	768	130	2333
V/C Ratio(X)	0.14	0.79	0.55	0.02	0.66	0.26
Avail Cap(c_a), veh/h	258	230	1718	768	218	2333
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	18.6	8.1	6.0	20.2	3.1
Incr Delay (d2), s/veh	0.3	15.9	1.3	0.0	5.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.0	4.3	0.1	1.2	1.6
LnGrp Delay(d),s/veh	17.2	34.5	9.3	6.0	25.8	3.4
LnGrp LOS	B	C	A	A	C	A
Approach Vol, veh/h	209		951			685
Approach Delay, s/veh	31.6		9.3			6.2
Approach LOS	C		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.8	26.2				34.0		10.8
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	5.5	19.5				29.5		6.5
Max Q Clear Time (g_c+I1), s	4.1	10.3				5.1		6.8
Green Ext Time (p_c), s	0.0	3.8				3.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	10.7
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	695	86	19	1091	7	169	3	24	2	3	1
Future Volume (veh/h)	1	695	86	19	1091	7	169	3	24	2	3	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	1	755	93	21	1186	8	184	3	26	2	3	1
Adj No. of Lanes	1	3	1	1	3	1	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	3	1304	406	43	1422	443	228	71	618	5	565	480
Arrive On Green	0.00	0.26	0.26	0.02	0.28	0.28	0.13	0.43	0.43	0.00	0.30	0.30
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1774	166	1442	1774	1863	1583
Grp Volume(v), veh/h	1	755	93	21	1186	8	184	0	29	2	3	1
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1774	0	1608	1774	1863	1583
Q Serve(g_s), s	0.0	8.1	2.9	0.7	13.7	0.2	6.3	0.0	0.7	0.1	0.1	0.0
Cycle Q Clear(g_c), s	0.0	8.1	2.9	0.7	13.7	0.2	6.3	0.0	0.7	0.1	0.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.90	1.00		1.00
Lane Grp Cap(c), veh/h	3	1304	406	43	1422	443	228	0	690	5	565	480
V/C Ratio(X)	0.35	0.58	0.23	0.48	0.83	0.02	0.81	0.00	0.04	0.41	0.01	0.00
Avail Cap(c_a), veh/h	142	1502	468	142	1502	468	269	0	690	142	565	480
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	20.3	18.4	30.2	21.2	16.3	26.5	0.0	10.4	31.2	15.2	15.2
Incr Delay (d2), s/veh	61.8	0.4	0.3	8.1	4.0	0.0	14.4	0.0	0.1	47.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.8	1.3	0.5	6.9	0.1	4.0	0.0	0.3	0.1	0.0	0.0
LnGrp Delay(d),s/veh	93.0	20.7	18.7	38.3	25.2	16.4	41.0	0.0	10.5	79.0	15.2	15.2
LnGrp LOS	F	C	B	D	C	B	D		B	E	B	B
Approach Vol, veh/h		849			1215			213			6	
Approach Delay, s/veh		20.6			25.4			36.8			36.5	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	31.4	6.0	20.6	12.5	23.5	4.6	22.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	23.5	5.0	18.5	9.5	19.0	5.0	18.5
Max Q Clear Time (g_c+I1), s	2.1	2.7	2.7	10.1	8.3	2.1	2.0	15.7
Green Ext Time (p_c), s	0.0	0.1	0.0	3.1	0.1	0.0	0.0	1.8

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

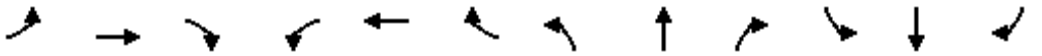
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	84	31	17	83	27	43	139	18	10	63	20
Future Vol, veh/h	11	84	31	17	83	27	43	139	18	10	63	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	91	34	18	90	29	47	151	20	11	68	22
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	9	10	9.6	9.5
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	12%	0%	13%	11%
Vol Thru, %	0%	89%	88%	0%	65%	68%
Vol Right, %	0%	11%	0%	100%	21%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	43	157	95	31	127	93
LT Vol	43	0	11	0	17	10
Through Vol	0	139	84	0	83	63
RT Vol	0	18	0	31	27	20
Lane Flow Rate	47	171	103	34	138	101
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.076	0.251	0.16	0.045	0.209	0.153
Departure Headway (Hd)	5.876	5.292	5.588	4.823	5.451	5.449
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	607	676	638	737	654	654
Service Time	3.636	3.052	3.356	2.591	3.518	3.519
HCM Lane V/C Ratio	0.077	0.253	0.161	0.046	0.211	0.154
HCM Control Delay	9.1	9.8	9.4	7.8	10	9.5
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0.2	1	0.6	0.1	0.8	0.5

HCM 6th Signalized Intersection Summary
1: Sanderson Ave & Ramona Expy

05/12/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	448	329	75	52	425	911	95	993	12	553	600	215
Future Volume (veh/h)	448	329	75	52	425	911	95	993	12	553	600	215
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	487	358	82	57	462	990	103	1079	13	601	652	234
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	432	901	475	131	592	584	159	1210	600	697	1763	984
Arrive On Green	0.12	0.25	0.25	0.04	0.17	0.17	0.05	0.34	0.34	0.20	0.50	0.50
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	487	358	82	57	462	990	103	1079	13	601	652	234
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	13.5	9.0	4.1	1.7	13.5	18.0	3.2	31.1	0.6	18.2	12.2	7.1
Cycle Q Clear(g_c), s	13.5	9.0	4.1	1.7	13.5	18.0	3.2	31.1	0.6	18.2	12.2	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	432	901	475	131	592	584	159	1210	600	697	1763	984
V/C Ratio(X)	1.13	0.40	0.17	0.44	0.78	1.70	0.65	0.89	0.02	0.86	0.37	0.24
Avail Cap(c_a), veh/h	432	901	475	160	592	584	221	1210	600	975	1763	984
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.3	33.5	28.0	50.9	43.1	34.1	50.7	33.8	21.1	41.7	16.8	9.1
Incr Delay (d2), s/veh	83.1	0.3	0.2	2.3	6.6	320.8	4.4	10.2	0.1	5.9	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.5	3.7	1.5	0.8	6.1	65.8	1.4	13.9	0.2	7.8	4.6	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	130.4	33.8	28.1	53.1	49.8	354.9	55.1	43.9	21.1	47.6	17.4	9.7
LnGrp LOS	F	C	C	D	D	F	E	D	C	D	B	A
Approach Vol, veh/h		927			1509			1195			1487	
Approach Delay, s/veh		84.0			250.1			44.6			28.4	
Approach LOS		F			F			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.3	41.3	8.6	31.9	9.5	58.1	18.0	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	30.5	30.0	5.0	26.5	6.9	53.6	13.5	18.0
Max Q Clear Time (g_c+I1), s	20.2	33.1	3.7	11.0	5.2	14.2	15.5	20.0
Green Ext Time (p_c), s	1.6	0.0	0.0	1.9	0.0	5.0	0.0	0.0

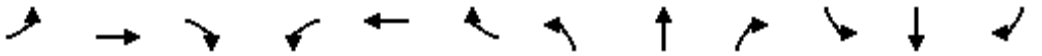
Intersection Summary	
HCM 6th Ctrl Delay	107.6
HCM 6th LOS	F



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	36	180	972	14	89	621
Future Volume (veh/h)	36	180	972	14	89	621
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	39	196	1057	15	97	675
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	257	229	1697	757	139	2330
Arrive On Green	0.14	0.14	0.48	0.48	0.08	0.66
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	39	196	1057	15	97	675
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	0.9	5.4	10.0	0.2	2.4	3.6
Cycle Q Clear(g_c), s	0.9	5.4	10.0	0.2	2.4	3.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	257	229	1697	757	139	2330
V/C Ratio(X)	0.15	0.86	0.62	0.02	0.70	0.29
Avail Cap(c_a), veh/h	257	229	1697	757	218	2330
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	18.8	8.7	6.2	20.2	3.3
Incr Delay (d2), s/veh	0.3	25.9	1.7	0.0	6.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	3.2	2.3	0.1	1.0	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.1	44.7	10.5	6.2	26.4	3.6
LnGrp LOS	B	D	B	A	C	A
Approach Vol, veh/h	235		1072			772
Approach Delay, s/veh	40.1		10.4			6.5
Approach LOS	D		B			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	8.0	26.0			34.0	11.0
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	5.5	19.5			29.5	6.5
Max Q Clear Time (g_c+I1), s	4.4	12.0			5.6	7.4
Green Ext Time (p_c), s	0.0	3.8			4.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	12.3
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	783	97	21	1229	8	190	3	27	2	3	1
Future Volume (veh/h)	1	783	97	21	1229	8	190	3	27	2	3	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1	851	105	23	1336	9	207	3	29	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	3	1332	414	47	1459	453	250	65	629	5	550	466
Arrive On Green	0.00	0.26	0.26	0.03	0.29	0.29	0.14	0.43	0.43	0.00	0.29	0.29
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	1781	151	1457	1781	1870	1585
Grp Volume(v), veh/h	1	851	105	23	1336	9	207	0	32	2	3	1
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1781	0	1608	1781	1870	1585
Q Serve(g_s), s	0.0	9.6	3.4	0.8	16.4	0.3	7.3	0.0	0.7	0.1	0.1	0.0
Cycle Q Clear(g_c), s	0.0	9.6	3.4	0.8	16.4	0.3	7.3	0.0	0.7	0.1	0.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.91	1.00		1.00
Lane Grp Cap(c), veh/h	3	1332	414	47	1459	453	250	0	694	5	550	466
V/C Ratio(X)	0.36	0.64	0.25	0.49	0.92	0.02	0.83	0.00	0.05	0.41	0.01	0.00
Avail Cap(c_a), veh/h	138	1461	454	138	1461	454	262	0	694	138	550	466
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	21.2	18.9	31.1	22.3	16.6	27.0	0.0	10.6	32.2	16.1	16.1
Incr Delay (d2), s/veh	65.5	0.8	0.3	7.9	9.3	0.0	18.6	0.0	0.1	47.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.2	1.1	0.4	6.6	0.1	4.1	0.0	0.2	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.7	22.0	19.2	38.9	31.7	16.6	45.6	0.0	10.8	79.6	16.2	16.1
LnGrp LOS	F	C	B	D	C	B	D	A	B	E	B	B
Approach Vol, veh/h		957			1368			239			6	
Approach Delay, s/veh		21.8			31.7			40.9			37.3	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	32.4	6.2	21.4	13.6	23.5	4.6	23.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	23.5	5.0	18.5	9.5	19.0	5.0	18.5
Max Q Clear Time (g_c+I1), s	2.1	2.7	2.8	11.6	9.3	2.1	2.0	18.4
Green Ext Time (p_c), s	0.0	0.1	0.0	3.0	0.0	0.0	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	28.9
HCM 6th LOS	C

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

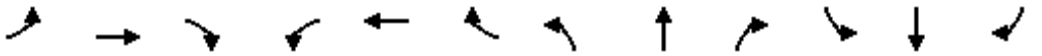
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	95	35	19	93	30	48	157	20	11	71	23
Future Vol, veh/h	12	95	35	19	93	30	48	157	20	11	71	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	103	38	21	101	33	52	171	22	12	77	25
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	9.4	10.5	10.2	9.9
HCM LOS	A	B	B	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	11%	0%	13%	10%
Vol Thru, %	0%	89%	89%	0%	65%	68%
Vol Right, %	0%	11%	0%	100%	21%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	48	177	107	35	142	105
LT Vol	48	0	12	0	19	11
Through Vol	0	157	95	0	93	71
RT Vol	0	20	0	35	30	23
Lane Flow Rate	52	192	116	38	154	114
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.087	0.289	0.185	0.052	0.24	0.177
Departure Headway (Hd)	5.994	5.41	5.73	4.967	5.596	5.59
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	593	658	621	713	636	635
Service Time	3.776	3.192	3.518	2.754	3.683	3.686
HCM Lane V/C Ratio	0.088	0.292	0.187	0.053	0.242	0.18
HCM Control Delay	9.4	10.4	9.8	8	10.5	9.9
HCM Lane LOS	A	B	A	A	B	A
HCM 95th-tile Q	0.3	1.2	0.7	0.2	0.9	0.6

HCM 6th Signalized Intersection Summary
1: Sanderson Ave & Ramona Expy

06/01/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	448	329	79	52	425	911	107	1005	12	553	604	215
Future Volume (veh/h)	448	329	79	52	425	911	107	1005	12	553	604	215
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	487	358	86	57	462	990	116	1092	13	601	657	234
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	430	897	480	131	589	582	173	1217	603	696	1755	980
Arrive On Green	0.12	0.25	0.25	0.04	0.17	0.17	0.05	0.34	0.34	0.20	0.49	0.49
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	487	358	86	57	462	990	116	1092	13	601	657	234
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	13.5	9.1	4.3	1.8	13.5	18.0	3.6	31.7	0.6	18.2	12.5	7.2
Cycle Q Clear(g_c), s	13.5	9.1	4.3	1.8	13.5	18.0	3.6	31.7	0.6	18.2	12.5	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	430	897	480	131	589	582	173	1217	603	696	1755	980
V/C Ratio(X)	1.13	0.40	0.18	0.44	0.78	1.70	0.67	0.90	0.02	0.86	0.37	0.24
Avail Cap(c_a), veh/h	430	897	480	159	589	582	220	1217	603	971	1755	980
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.5	33.7	27.9	51.1	43.4	34.3	50.7	33.9	21.0	41.9	17.1	9.3
Incr Delay (d2), s/veh	85.0	0.3	0.2	2.3	6.8	322.7	5.3	10.5	0.1	6.0	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.6	3.7	1.6	0.8	6.2	66.0	1.6	14.2	0.2	7.9	4.7	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	132.5	34.0	28.1	53.4	50.3	357.0	55.9	44.4	21.1	47.9	17.7	9.9
LnGrp LOS	F	C	C	D	D	F	E	D	C	D	B	A
Approach Vol, veh/h		931			1509			1221			1492	
Approach Delay, s/veh		85.0			251.6			45.2			28.6	
Approach LOS		F			F			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.4	41.7	8.6	31.9	9.9	58.1	18.0	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	30.5	30.0	5.0	26.5	6.9	53.6	13.5	18.0
Max Q Clear Time (g_c+I1), s	20.2	33.7	3.8	11.1	5.6	14.5	15.5	20.0
Green Ext Time (p_c), s	1.6	0.0	0.0	1.9	0.0	5.1	0.0	0.0

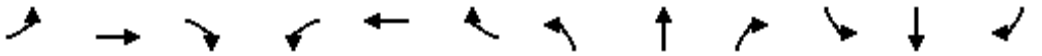
Intersection Summary	
HCM 6th Ctrl Delay	108.0
HCM 6th LOS	F



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	36	180	972	14	89	621
Future Volume (veh/h)	36	180	972	14	89	621
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	39	196	1057	15	97	675
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	257	229	1697	757	139	2330
Arrive On Green	0.14	0.14	0.48	0.48	0.08	0.66
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	39	196	1057	15	97	675
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	0.9	5.4	10.0	0.2	2.4	3.6
Cycle Q Clear(g_c), s	0.9	5.4	10.0	0.2	2.4	3.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	257	229	1697	757	139	2330
V/C Ratio(X)	0.15	0.86	0.62	0.02	0.70	0.29
Avail Cap(c_a), veh/h	257	229	1697	757	218	2330
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	18.8	8.7	6.2	20.2	3.3
Incr Delay (d2), s/veh	0.3	25.9	1.7	0.0	6.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	3.2	2.3	0.1	1.0	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.1	44.7	10.5	6.2	26.4	3.6
LnGrp LOS	B	D	B	A	C	A
Approach Vol, veh/h	235		1072			772
Approach Delay, s/veh	40.1		10.4			6.5
Approach LOS	D		B			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	8.0	26.0			34.0	11.0
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	5.5	19.5			29.5	6.5
Max Q Clear Time (g_c+I1), s	4.4	12.0			5.6	7.4
Green Ext Time (p_c), s	0.0	3.8			4.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	12.3
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	783	97	24	1229	8	190	3	35	2	3	1
Future Volume (veh/h)	1	783	97	24	1229	8	190	3	35	2	3	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1	851	105	26	1336	9	207	3	38	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	3	1318	409	51	1459	453	250	51	641	5	550	466
Arrive On Green	0.00	0.26	0.26	0.03	0.29	0.29	0.14	0.43	0.43	0.00	0.29	0.29
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	1781	117	1486	1781	1870	1585
Grp Volume(v), veh/h	1	851	105	26	1336	9	207	0	41	2	3	1
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1781	0	1603	1781	1870	1585
Q Serve(g_s), s	0.0	9.6	3.4	0.9	16.4	0.3	7.3	0.0	1.0	0.1	0.1	0.0
Cycle Q Clear(g_c), s	0.0	9.6	3.4	0.9	16.4	0.3	7.3	0.0	1.0	0.1	0.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.93	1.00		1.00
Lane Grp Cap(c), veh/h	3	1318	409	51	1459	453	250	0	692	5	550	466
V/C Ratio(X)	0.36	0.65	0.26	0.51	0.92	0.02	0.83	0.00	0.06	0.41	0.01	0.00
Avail Cap(c_a), veh/h	138	1461	454	138	1461	454	262	0	692	138	550	466
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	21.3	19.0	30.9	22.3	16.6	27.0	0.0	10.7	32.2	16.1	16.1
Incr Delay (d2), s/veh	65.5	0.9	0.3	7.5	9.3	0.0	18.6	0.0	0.2	47.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.3	1.1	0.5	6.6	0.1	4.1	0.0	0.3	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.7	22.2	19.4	38.4	31.7	16.6	45.6	0.0	10.9	79.6	16.2	16.1
LnGrp LOS	F	C	B	D	C	B	D	A	B	E	B	B
Approach Vol, veh/h		957			1371			248			6	
Approach Delay, s/veh		22.0			31.7			39.8			37.3	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	32.4	6.4	21.2	13.6	23.5	4.6	23.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	23.5	5.0	18.5	9.5	19.0	5.0	18.5
Max Q Clear Time (g_c+I1), s	2.1	3.0	2.9	11.6	9.3	2.1	2.0	18.4
Green Ext Time (p_c), s	0.0	0.1	0.0	3.0	0.0	0.0	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	28.9
HCM 6th LOS	C

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	111	68	19	99	30	60	157	20	11	71	27
Future Vol, veh/h	20	111	68	19	99	30	60	157	20	11	71	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	121	74	21	108	33	65	171	22	12	77	29
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	9.8	11	10.6	10.4
HCM LOS	A	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	15%	0%	13%	10%
Vol Thru, %	0%	89%	85%	0%	67%	65%
Vol Right, %	0%	11%	0%	100%	20%	25%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	60	177	131	68	148	109
LT Vol	60	0	20	0	19	11
Through Vol	0	157	111	0	99	71
RT Vol	0	20	0	68	30	27
Lane Flow Rate	65	192	142	74	161	118
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.114	0.305	0.235	0.106	0.262	0.194
Departure Headway (Hd)	6.291	5.706	5.938	5.153	5.861	5.903
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	571	631	605	696	615	609
Service Time	4.015	3.43	3.665	2.879	3.888	3.932
HCM Lane V/C Ratio	0.114	0.304	0.235	0.106	0.262	0.194
HCM Control Delay	9.8	10.9	10.5	8.5	11	10.4
HCM Lane LOS	A	B	B	A	B	B
HCM 95th-tile Q	0.4	1.3	0.9	0.4	1	0.7

Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	102	9	15	164	25	41
Future Vol, veh/h	102	9	15	164	25	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	140	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	111	10	16	178	27	45

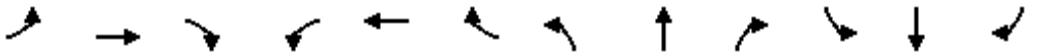
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	121	0	321	111
Stage 1	-	-	-	-	111	-
Stage 2	-	-	-	-	210	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1467	-	673	942
Stage 1	-	-	-	-	914	-
Stage 2	-	-	-	-	825	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1467	-	666	942
Mov Cap-2 Maneuver	-	-	-	-	666	-
Stage 1	-	-	-	-	904	-
Stage 2	-	-	-	-	825	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	814	-	-	1467	-
HCM Lane V/C Ratio	0.088	-	-	0.011	-
HCM Control Delay (s)	9.9	-	-	7.5	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-

HCM 6th Signalized Intersection Summary
1: Sanderson Ave & Ramona Expy

05/12/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	457	335	77	53	433	929	96	1013	13	564	612	219
Future Volume (veh/h)	457	335	77	53	433	929	96	1013	13	564	612	219
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	497	364	84	58	471	1010	104	1101	14	613	665	238
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	432	900	475	132	592	589	160	1198	595	708	1762	984
Arrive On Green	0.12	0.25	0.25	0.04	0.17	0.17	0.05	0.34	0.34	0.21	0.50	0.50
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	497	364	84	58	471	1010	104	1101	14	613	665	238
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	13.5	9.2	4.2	1.8	13.8	18.0	3.2	32.2	0.6	18.5	12.5	7.2
Cycle Q Clear(g_c), s	13.5	9.2	4.2	1.8	13.8	18.0	3.2	32.2	0.6	18.5	12.5	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	432	900	475	132	592	589	160	1198	595	708	1762	984
V/C Ratio(X)	1.15	0.40	0.18	0.44	0.80	1.72	0.65	0.92	0.02	0.87	0.38	0.24
Avail Cap(c_a), veh/h	432	900	475	160	592	589	221	1198	595	975	1762	984
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.3	33.6	28.0	50.9	43.3	34.0	50.7	34.4	21.3	41.5	16.9	9.2
Incr Delay (d2), s/veh	91.8	0.3	0.2	2.3	7.5	329.0	4.4	12.7	0.1	6.2	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.0	3.8	1.5	0.8	6.3	67.7	1.4	14.8	0.2	8.0	4.7	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	139.1	33.9	28.2	53.2	50.8	363.0	55.1	47.1	21.4	47.7	17.5	9.7
LnGrp LOS	F	C	C	D	D	F	E	D	C	D	B	A
Approach Vol, veh/h		945			1539			1219			1516	
Approach Delay, s/veh		88.7			255.7			47.5			28.5	
Approach LOS		F			F			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.7	40.9	8.6	31.9	9.5	58.1	18.0	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	30.5	30.0	5.0	26.5	6.9	53.6	13.5	18.0
Max Q Clear Time (g_c+I1), s	20.5	34.2	3.8	11.2	5.2	14.5	15.5	20.0
Green Ext Time (p_c), s	1.6	0.0	0.0	2.0	0.0	5.2	0.0	0.0

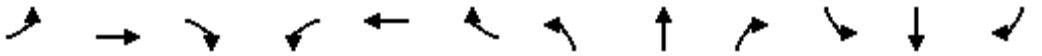
Intersection Summary	
HCM 6th Ctrl Delay	110.8
HCM 6th LOS	F



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	184	991	14	91	633
Future Volume (veh/h)	37	184	991	14	91	633
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	200	1077	15	99	688
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	257	229	1694	756	141	2330
Arrive On Green	0.14	0.14	0.48	0.48	0.08	0.66
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	40	200	1077	15	99	688
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	0.9	5.6	10.2	0.2	2.4	3.7
Cycle Q Clear(g_c), s	0.9	5.6	10.2	0.2	2.4	3.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	257	229	1694	756	141	2330
V/C Ratio(X)	0.16	0.87	0.64	0.02	0.70	0.30
Avail Cap(c_a), veh/h	257	229	1694	756	218	2330
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	18.8	8.8	6.2	20.2	3.3
Incr Delay (d2), s/veh	0.3	28.9	1.8	0.0	6.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	3.5	2.4	0.1	1.0	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.1	47.7	10.7	6.3	26.5	3.6
LnGrp LOS	B	D	B	A	C	A
Approach Vol, veh/h	240		1092			787
Approach Delay, s/veh	42.6		10.6			6.5
Approach LOS	D		B			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	8.0	26.0			34.0	11.0
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	5.5	19.5			29.5	6.5
Max Q Clear Time (g_c+I1), s	4.4	12.2			5.7	7.6
Green Ext Time (p_c), s	0.0	3.7			4.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	12.7
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	798	99	22	1253	8	194	3	28	2	3	1
Future Volume (veh/h)	1	798	99	22	1253	8	194	3	28	2	3	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1	867	108	24	1362	9	211	3	30	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	3	1325	411	48	1457	452	254	63	633	5	548	464
Arrive On Green	0.00	0.26	0.26	0.03	0.29	0.29	0.14	0.43	0.43	0.00	0.29	0.29
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	1781	146	1461	1781	1870	1585
Grp Volume(v), veh/h	1	867	108	24	1362	9	211	0	33	2	3	1
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1781	0	1607	1781	1870	1585
Q Serve(g_s), s	0.0	9.8	3.5	0.9	16.9	0.3	7.5	0.0	0.8	0.1	0.1	0.0
Cycle Q Clear(g_c), s	0.0	9.8	3.5	0.9	16.9	0.3	7.5	0.0	0.8	0.1	0.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.91	1.00		1.00
Lane Grp Cap(c), veh/h	3	1325	411	48	1457	452	254	0	696	5	548	464
V/C Ratio(X)	0.36	0.65	0.26	0.50	0.94	0.02	0.83	0.00	0.05	0.41	0.01	0.00
Avail Cap(c_a), veh/h	137	1457	452	137	1457	452	261	0	696	137	548	464
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.3	21.4	19.1	31.1	22.6	16.7	27.0	0.0	10.6	32.3	16.2	16.2
Incr Delay (d2), s/veh	65.9	0.9	0.3	7.7	11.5	0.0	19.3	0.0	0.1	47.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.4	1.1	0.4	7.0	0.1	4.2	0.0	0.2	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	98.2	22.3	19.4	38.8	34.1	16.7	46.3	0.0	10.8	79.7	16.3	16.2
LnGrp LOS	F	C	B	D	C	B	D	A	B	E	B	B
Approach Vol, veh/h		976			1395			244			6	
Approach Delay, s/veh		22.1			34.0			41.5			37.4	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	32.6	6.3	21.3	13.8	23.5	4.6	23.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	23.5	5.0	18.5	9.5	19.0	5.0	18.5
Max Q Clear Time (g_c+I1), s	2.1	2.8	2.9	11.8	9.5	2.1	2.0	18.9
Green Ext Time (p_c), s	0.0	0.1	0.0	3.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	30.3
HCM 6th LOS	C

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

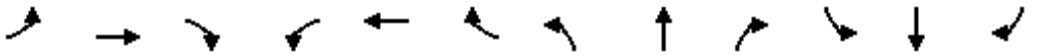
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	96	36	20	95	31	49	160	21	11	72	23
Future Vol, veh/h	13	96	36	20	95	31	49	160	21	11	72	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	104	39	22	103	34	53	174	23	12	78	25
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	9.5	10.6	10.3	10
HCM LOS	A	B	B	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	12%	0%	14%	10%
Vol Thru, %	0%	88%	88%	0%	65%	68%
Vol Right, %	0%	12%	0%	100%	21%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	49	181	109	36	146	106
LT Vol	49	0	13	0	20	11
Through Vol	0	160	96	0	95	72
RT Vol	0	21	0	36	31	23
Lane Flow Rate	53	197	118	39	159	115
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.089	0.297	0.193	0.055	0.248	0.183
Departure Headway (Hd)	6.019	5.433	5.859	5.091	5.723	5.724
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	589	653	616	708	632	630
Service Time	3.817	3.231	3.559	2.791	3.723	3.733
HCM Lane V/C Ratio	0.09	0.302	0.192	0.055	0.252	0.183
HCM Control Delay	9.4	10.6	10	8.1	10.6	10
HCM Lane LOS	A	B	A	A	B	A
HCM 95th-tile Q	0.3	1.2	0.7	0.2	1	0.7

HCM 6th Signalized Intersection Summary
1: Sanderson Ave & Ramona Expy

05/12/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	457	335	83	53	433	929	112	1029	13	564	618	219
Future Volume (veh/h)	457	335	83	53	433	929	112	1029	13	564	618	219
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	497	364	90	58	471	1010	122	1118	14	613	672	238
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	429	894	481	131	588	587	180	1209	599	708	1751	978
Arrive On Green	0.12	0.25	0.25	0.04	0.17	0.17	0.05	0.34	0.34	0.20	0.49	0.49
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	497	364	90	58	471	1010	122	1118	14	613	672	238
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	13.5	9.3	4.6	1.8	13.9	18.0	3.8	32.9	0.6	18.7	12.9	7.4
Cycle Q Clear(g_c), s	13.5	9.3	4.6	1.8	13.9	18.0	3.8	32.9	0.6	18.7	12.9	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	429	894	481	131	588	587	180	1209	599	708	1751	978
V/C Ratio(X)	1.16	0.41	0.19	0.44	0.80	1.72	0.68	0.93	0.02	0.87	0.38	0.24
Avail Cap(c_a), veh/h	429	894	481	159	588	587	219	1209	599	969	1751	978
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.6	33.9	28.0	51.2	43.7	34.2	50.7	34.6	21.2	41.8	17.2	9.4
Incr Delay (d2), s/veh	94.5	0.3	0.2	2.3	7.8	331.6	6.2	13.2	0.1	6.3	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.1	3.8	1.6	0.8	6.4	68.1	1.7	15.2	0.2	8.1	4.8	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	142.2	34.2	28.1	53.5	51.4	365.8	56.8	47.8	21.3	48.1	17.9	10.0
LnGrp LOS	F	C	C	D	D	F	E	D	C	D	B	A
Approach Vol, veh/h		951			1539			1254			1523	
Approach Delay, s/veh		90.1			257.8			48.3			28.8	
Approach LOS		F			F			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.8	41.5	8.6	31.9	10.2	58.1	18.0	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	30.5	30.0	5.0	26.5	6.9	53.6	13.5	18.0
Max Q Clear Time (g_c+I1), s	20.7	34.9	3.8	11.3	5.8	14.9	15.5	20.0
Green Ext Time (p_c), s	1.6	0.0	0.0	2.0	0.0	5.2	0.0	0.0

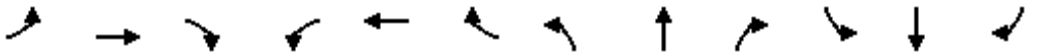
Intersection Summary	
HCM 6th Ctrl Delay	111.4
HCM 6th LOS	F



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	205	1002	14	98	637
Future Volume (veh/h)	37	205	1002	14	98	637
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	223	1089	15	107	692
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	257	229	1683	751	146	2330
Arrive On Green	0.14	0.14	0.47	0.47	0.08	0.66
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	40	223	1089	15	107	692
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	0.9	6.3	10.5	0.2	2.6	3.7
Cycle Q Clear(g_c), s	0.9	6.3	10.5	0.2	2.6	3.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	257	229	1683	751	146	2330
V/C Ratio(X)	0.16	0.97	0.65	0.02	0.73	0.30
Avail Cap(c_a), veh/h	257	229	1683	751	218	2330
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	19.2	9.0	6.3	20.2	3.3
Incr Delay (d2), s/veh	0.3	51.9	1.9	0.0	6.9	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	5.2	2.5	0.1	1.1	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.1	71.1	10.9	6.3	27.1	3.6
LnGrp LOS	B	E	B	A	C	A
Approach Vol, veh/h	263		1104			799
Approach Delay, s/veh	62.9		10.9			6.8
Approach LOS	E		B			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	8.2	25.8			34.0	11.0
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	5.5	19.5			29.5	6.5
Max Q Clear Time (g_c+I1), s	4.6	12.5			5.7	8.3
Green Ext Time (p_c), s	0.0	3.7			4.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	15.7
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	798	99	26	1253	8	194	3	39	2	3	1
Future Volume (veh/h)	1	798	99	26	1253	8	194	3	39	2	3	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1	867	108	28	1362	9	211	3	42	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	3	1308	406	54	1457	452	254	46	647	5	548	464
Arrive On Green	0.00	0.26	0.26	0.03	0.29	0.29	0.14	0.43	0.43	0.00	0.29	0.29
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	1781	107	1495	1781	1870	1585
Grp Volume(v), veh/h	1	867	108	28	1362	9	211	0	45	2	3	1
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1781	0	1601	1781	1870	1585
Q Serve(g_s), s	0.0	9.9	3.5	1.0	16.9	0.3	7.5	0.0	1.1	0.1	0.1	0.0
Cycle Q Clear(g_c), s	0.0	9.9	3.5	1.0	16.9	0.3	7.5	0.0	1.1	0.1	0.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.93	1.00		1.00
Lane Grp Cap(c), veh/h	3	1308	406	54	1457	452	254	0	693	5	548	464
V/C Ratio(X)	0.36	0.66	0.27	0.51	0.94	0.02	0.83	0.00	0.06	0.41	0.01	0.00
Avail Cap(c_a), veh/h	137	1457	452	137	1457	452	261	0	693	137	548	464
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.3	21.6	19.3	31.0	22.6	16.7	27.0	0.0	10.7	32.3	16.2	16.2
Incr Delay (d2), s/veh	65.9	1.0	0.3	7.3	11.5	0.0	19.3	0.0	0.2	47.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.4	1.1	0.5	7.0	0.1	4.2	0.0	0.3	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	98.2	22.6	19.6	38.3	34.1	16.7	46.3	0.0	10.9	79.7	16.3	16.2
LnGrp LOS	F	C	B	D	C	B	D	A	B	E	B	B
Approach Vol, veh/h		976			1399			256			6	
Approach Delay, s/veh		22.3			34.0			40.1			37.4	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	32.6	6.5	21.1	13.8	23.5	4.6	23.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	23.5	5.0	18.5	9.5	19.0	5.0	18.5
Max Q Clear Time (g_c+I1), s	2.1	3.1	3.0	11.9	9.5	2.1	2.0	18.9
Green Ext Time (p_c), s	0.0	0.1	0.0	3.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	30.3
HCM 6th LOS	C

Intersection	
Intersection Delay, s/veh	10.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	118	47	20	103	31	53	160	21	11	72	27
Future Vol, veh/h	24	118	47	20	103	31	53	160	21	11	72	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	128	51	22	112	34	58	174	23	12	78	29
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	10.1	11.1	10.7	10.4
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	17%	0%	13%	10%
Vol Thru, %	0%	88%	83%	0%	67%	65%
Vol Right, %	0%	12%	0%	100%	20%	25%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	53	181	142	47	154	110
LT Vol	53	0	24	0	20	11
Through Vol	0	160	118	0	103	72
RT Vol	0	21	0	47	31	27
Lane Flow Rate	58	197	154	51	167	120
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.101	0.312	0.255	0.073	0.272	0.196
Departure Headway (Hd)	6.295	5.708	5.952	5.159	5.852	5.907
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	570	632	605	695	614	609
Service Time	4.019	3.432	3.679	2.886	3.88	3.937
HCM Lane V/C Ratio	0.102	0.312	0.255	0.073	0.272	0.197
HCM Control Delay	9.7	11	10.7	8.3	11.1	10.4
HCM Lane LOS	A	B	B	A	B	B
HCM 95th-tile Q	0.3	1.3	1	0.2	1.1	0.7

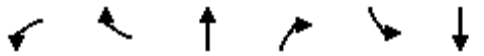
Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	105	7	15	168	21	43
Future Vol, veh/h	105	7	15	168	21	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	140	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	114	8	16	183	23	47

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	122	0	329	114
Stage 1	-	-	-	-	114	-
Stage 2	-	-	-	-	215	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1465	-	665	939
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	821	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1465	-	658	939
Mov Cap-2 Maneuver	-	-	-	-	658	-
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	821	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	824	-	-	1465	-
HCM Lane V/C Ratio	0.084	-	-	0.011	-
HCM Control Delay (s)	9.8	-	-	7.5	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	32	11	991	11	4	670
Future Volume (veh/h)	32	11	991	11	4	670
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	35	12	1077	12	4	728
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	2	2	2	2
Cap, veh/h	0	0	1943	22	10	2746
Arrive On Green	0.00	0.00	0.54	0.54	0.01	0.77
Sat Flow, veh/h	0	0	3693	40	1781	3647
Grp Volume(v), veh/h	0	0	532	557	4	728
Grp Sat Flow(s),veh/h/ln	0	0	1777	1863	1781	1777
Q Serve(g_s), s	0.0	0.0	3.9	3.9	0.0	1.2
Cycle Q Clear(g_c), s	0.0	0.0	3.9	3.9	0.0	1.2
Prop In Lane	0.00	0.00		0.02	1.00	
Lane Grp Cap(c), veh/h	0	0	959	1006	10	2746
V/C Ratio(X)	0.00	0.00	0.55	0.55	0.41	0.27
Avail Cap(c_a), veh/h	0	0	1616	1694	450	3232
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	3.0	3.0	9.8	0.6
Incr Delay (d2), s/veh	0.0	0.0	0.5	0.5	25.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	0.1	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	3.5	3.5	34.9	0.7
LnGrp LOS	A	A	A	A	C	A
Approach Vol, veh/h	0		1089			732
Approach Delay, s/veh	0.0		3.5			0.9
Approach LOS			A			A

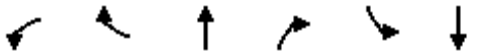
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	4.6	15.2			19.8	0.0
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	5.0	18.0			18.0	18.0
Max Q Clear Time (g_c+I1), s	2.0	5.9			3.2	0.0
Green Ext Time (p_c), s	0.0	4.8			3.7	0.0

Intersection Summary	
HCM 6th Ctrl Delay	2.4
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	398	516	158	53	396	613	177	804	31	829	1502	579
Future Volume (veh/h)	398	516	158	53	396	613	177	804	31	829	1502	579
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	433	561	172	58	430	666	192	874	34	901	1633	629
Adj No. of Lanes	2	2	1	2	2	1	2	2	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	479	938	522	130	579	687	222	933	477	929	1660	963
Arrive On Green	0.14	0.26	0.26	0.04	0.16	0.16	0.06	0.26	0.26	0.27	0.47	0.47
Sat Flow, veh/h	3442	3539	1583	3442	3539	1583	3442	3539	1583	3442	3539	1583
Grp Volume(v), veh/h	433	561	172	58	430	666	192	874	34	901	1633	629
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1721	1770	1583	1721	1770	1583	1721	1770	1583
Q Serve(g_s), s	13.6	15.2	1.1	1.8	12.7	18.0	6.1	26.6	1.7	28.5	50.0	13.1
Cycle Q Clear(g_c), s	13.6	15.2	1.1	1.8	12.7	18.0	6.1	26.6	1.7	28.5	50.0	13.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	479	938	522	130	579	687	222	933	477	929	1660	963
V/C Ratio(X)	0.90	0.60	0.33	0.45	0.74	0.97	0.86	0.94	0.07	0.97	0.98	0.65
Avail Cap(c_a), veh/h	479	938	522	166	579	687	222	933	477	929	1660	963
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.6	35.3	16.4	51.8	43.8	14.6	51.0	39.6	27.4	39.7	28.8	14.0
Incr Delay (d2), s/veh	20.5	1.1	0.4	2.4	5.1	27.0	27.9	17.6	0.3	22.3	18.5	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	7.5	3.0	0.9	6.6	21.9	3.7	15.3	0.8	16.4	28.5	10.9
LnGrp Delay(d),s/veh	67.1	36.4	16.8	54.2	48.9	41.5	78.9	57.2	27.7	62.0	47.3	17.5
LnGrp LOS	E	D	B	D	D	D	E	E	C	E	D	B
Approach Vol, veh/h		1166			1154			1100			3163	
Approach Delay, s/veh		44.9			44.9			60.1			45.6	
Approach LOS		D			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	34.2	33.5	8.7	33.6	11.6	56.1	19.8	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.7	29.0	5.3	28.0	7.1	51.6	15.3	18.0
Max Q Clear Time (g_c+I1), s	30.5	28.6	3.8	17.2	8.1	52.0	15.6	20.0
Green Ext Time (p_c), s	0.0	0.2	0.0	2.8	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	47.8
HCM 2010 LOS	D



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	56	150	870	38	295	1423
Future Volume (veh/h)	56	150	870	38	295	1423
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	61	163	946	41	321	1547
Adj No. of Lanes	1	1	2	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	177	158	1557	696	381	2606
Arrive On Green	0.10	0.10	0.44	0.44	0.21	0.74
Sat Flow, veh/h	1774	1583	3632	1583	1774	3632
Grp Volume(v), veh/h	61	163	946	41	321	1547
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1583	1774	1770
Q Serve(g_s), s	1.8	5.5	11.2	0.8	9.5	11.3
Cycle Q Clear(g_c), s	1.8	5.5	11.2	0.8	9.5	11.3
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	177	158	1557	696	381	2606
V/C Ratio(X)	0.34	1.03	0.61	0.06	0.84	0.59
Avail Cap(c_a), veh/h	177	158	1557	696	500	2606
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	24.7	11.8	8.9	20.7	3.4
Incr Delay (d2), s/veh	1.1	79.5	1.8	0.2	9.8	1.0
Initial Q Delay(d3),s/veh	0.0	0.3	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	5.9	5.8	0.4	5.7	5.5
LnGrp Delay(d),s/veh	24.2	104.6	13.5	9.0	30.5	4.4
LnGrp LOS	C	F	B	A	C	A
Approach Vol, veh/h	224		987			1868
Approach Delay, s/veh	82.7		13.4			8.9
Approach LOS	F		B			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	16.3	28.7				45.0		10.0
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	15.5	20.5				40.5		5.5
Max Q Clear Time (g_c+I1), s	11.5	13.2				13.3		7.5
Green Ext Time (p_c), s	0.4	3.3				12.3		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	15.7
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1195	134	41	834	1	145	3	41	3	9	5
Future Volume (veh/h)	4	1195	134	41	834	1	145	3	41	3	9	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	4	1299	146	45	907	1	158	3	45	3	10	5
Adj No. of Lanes	1	3	1	1	3	1	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	10	1469	457	75	1658	516	197	39	589	7	533	453
Arrive On Green	0.01	0.29	0.29	0.04	0.33	0.33	0.11	0.39	0.39	0.00	0.29	0.29
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1774	100	1498	1774	1863	1583
Grp Volume(v), veh/h	4	1299	146	45	907	1	158	0	48	3	10	5
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1774	0	1598	1774	1863	1583
Q Serve(g_s), s	0.1	16.2	4.8	1.7	9.7	0.0	5.8	0.0	1.2	0.1	0.3	0.2
Cycle Q Clear(g_c), s	0.1	16.2	4.8	1.7	9.7	0.0	5.8	0.0	1.2	0.1	0.3	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.94	1.00		1.00
Lane Grp Cap(c), veh/h	10	1469	457	75	1658	516	197	0	629	7	533	453
V/C Ratio(X)	0.42	0.88	0.32	0.60	0.55	0.00	0.80	0.00	0.08	0.42	0.02	0.01
Avail Cap(c_a), veh/h	134	1494	465	134	1658	516	227	0	629	134	533	453
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.9	22.5	18.5	31.2	18.3	15.1	28.8	0.0	12.6	33.0	17.0	17.0
Incr Delay (d2), s/veh	27.0	6.6	0.4	7.4	0.4	0.0	16.3	0.0	0.2	34.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	8.5	2.1	1.0	4.6	0.0	3.7	0.0	0.6	0.1	0.1	0.1
LnGrp Delay(d),s/veh	59.9	29.1	18.9	38.6	18.7	15.1	45.1	0.0	12.8	67.2	17.1	17.0
LnGrp LOS	E	C	B	D	B	B	D		B	E	B	B
Approach Vol, veh/h		1449			953			206			18	
Approach Delay, s/veh		28.2			19.7			37.6			25.4	
Approach LOS		C			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	30.6	7.3	23.7	11.9	23.5	4.9	26.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	22.5	5.0	19.5	8.5	19.0	5.0	19.5
Max Q Clear Time (g_c+I1), s	2.1	3.2	3.7	18.2	7.8	2.3	2.1	11.7
Green Ext Time (p_c), s	0.0	0.1	0.0	1.0	0.0	0.0	0.0	3.3

Intersection Summary	
HCM 2010 Ctrl Delay	25.8
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	11.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	141	71	6	113	25	39	152	6	27	145	16
Future Vol, veh/h	16	141	71	6	113	25	39	152	6	27	145	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	153	77	7	123	27	42	165	7	29	158	17
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	10.5	11.4	10.9	12.3
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	10%	0%	4%	14%
Vol Thru, %	0%	96%	90%	0%	78%	77%
Vol Right, %	0%	4%	0%	100%	17%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	39	158	157	71	144	188
LT Vol	39	0	16	0	6	27
Through Vol	0	152	141	0	113	145
RT Vol	0	6	0	71	25	16
Lane Flow Rate	42	172	171	77	157	204
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.077	0.287	0.289	0.114	0.266	0.344
Departure Headway (Hd)	6.546	6.012	6.101	5.34	6.125	6.067
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	547	598	589	671	585	593
Service Time	4.286	3.752	3.84	3.078	4.167	4.107
HCM Lane V/C Ratio	0.077	0.288	0.29	0.115	0.268	0.344
HCM Control Delay	9.8	11.2	11.3	8.8	11.4	12.3
HCM Lane LOS	A	B	B	A	B	B
HCM 95th-tile Q	0.2	1.2	1.2	0.4	1.1	1.5

HCM 6th Signalized Intersection Summary
1: Sanderson Ave & Ramona Expy

05/12/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	448	581	178	60	446	690	199	905	35	934	1691	652
Future Volume (veh/h)	448	581	178	60	446	690	199	905	35	934	1691	652
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	487	632	193	65	485	750	216	984	38	1015	1838	709
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	481	936	520	136	582	687	223	937	480	933	1667	964
Arrive On Green	0.14	0.26	0.26	0.04	0.16	0.16	0.06	0.26	0.26	0.27	0.47	0.47
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	487	632	193	65	485	750	216	984	38	1015	1838	709
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	15.3	17.5	1.9	2.0	14.5	18.0	6.9	29.0	1.9	29.7	51.6	19.6
Cycle Q Clear(g_c), s	15.3	17.5	1.9	2.0	14.5	18.0	6.9	29.0	1.9	29.7	51.6	19.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	481	936	520	136	582	687	223	937	480	933	1667	964
V/C Ratio(X)	1.01	0.67	0.37	0.48	0.83	1.09	0.97	1.05	0.08	1.09	1.10	0.74
Avail Cap(c_a), veh/h	481	936	520	167	582	687	223	937	480	933	1667	964
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.4	36.3	17.1	51.7	44.6	15.3	51.3	40.5	27.4	40.1	29.2	15.3
Incr Delay (d2), s/veh	44.4	1.9	0.4	2.6	10.1	61.8	51.1	43.5	0.3	56.3	55.8	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	7.4	2.6	0.9	6.9	18.2	4.4	17.4	0.7	19.0	32.1	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	91.7	38.2	17.6	54.4	54.7	77.2	102.5	84.0	27.7	96.5	85.0	20.3
LnGrp LOS	F	D	B	D	D	F	F	F	C	F	F	C
Approach Vol, veh/h		1312			1300			1238			3562	
Approach Delay, s/veh		55.1			67.6			85.5			75.4	
Approach LOS		E			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	34.2	33.5	8.8	33.5	11.6	56.1	19.8	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.7	29.0	5.3	28.0	7.1	51.6	15.3	18.0
Max Q Clear Time (g_c+I1), s	31.7	31.0	4.0	19.5	8.9	53.6	17.3	20.0
Green Ext Time (p_c), s	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0

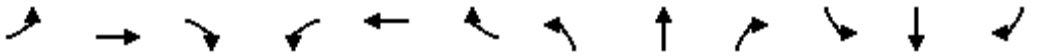
Intersection Summary	
HCM 6th Ctrl Delay	72.1
HCM 6th LOS	E



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	63	169	980	43	332	1603
Future Volume (veh/h)	63	169	980	43	332	1603
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	184	1065	47	361	1742
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	178	159	1489	664	419	2617
Arrive On Green	0.10	0.10	0.42	0.42	0.24	0.74
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	68	184	1065	47	361	1742
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	2.0	5.5	13.7	1.0	10.7	13.9
Cycle Q Clear(g_c), s	2.0	5.5	13.7	1.0	10.7	13.9
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	178	159	1489	664	419	2617
V/C Ratio(X)	0.38	1.16	0.72	0.07	0.86	0.67
Avail Cap(c_a), veh/h	178	159	1489	664	502	2617
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	24.8	13.3	9.6	20.2	3.7
Incr Delay (d2), s/veh	1.3	121.3	3.0	0.2	12.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	7.1	4.3	0.3	4.9	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.5	146.0	16.2	9.8	32.5	5.1
LnGrp LOS	C	F	B	A	C	A
Approach Vol, veh/h	252		1112			2103
Approach Delay, s/veh	113.2		15.9			9.8
Approach LOS	F		B			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	17.5	27.5			45.0	10.0
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	15.5	20.5			40.5	5.5
Max Q Clear Time (g_c+I1), s	12.7	15.7			15.9	7.5
Green Ext Time (p_c), s	0.3	2.7			13.6	0.0

Intersection Summary	
HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1346	151	46	939	1	163	3	46	3	10	6
Future Volume (veh/h)	5	1346	151	46	939	1	163	3	46	3	10	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	1463	164	50	1021	1	177	3	50	3	11	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	12	1468	456	80	1664	517	217	36	600	7	524	444
Arrive On Green	0.01	0.29	0.29	0.04	0.33	0.33	0.12	0.40	0.40	0.00	0.28	0.28
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	1781	91	1508	1781	1870	1585
Grp Volume(v), veh/h	5	1463	164	50	1021	1	177	0	53	3	11	7
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1781	0	1599	1781	1870	1585
Q Serve(g_s), s	0.2	19.4	5.6	1.9	11.4	0.0	6.6	0.0	1.4	0.1	0.3	0.2
Cycle Q Clear(g_c), s	0.2	19.4	5.6	1.9	11.4	0.0	6.6	0.0	1.4	0.1	0.3	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.94	1.00		1.00
Lane Grp Cap(c), veh/h	12	1468	456	80	1664	517	217	0	636	7	524	444
V/C Ratio(X)	0.42	1.00	0.36	0.62	0.61	0.00	0.82	0.00	0.08	0.42	0.02	0.02
Avail Cap(c_a), veh/h	131	1468	456	131	1664	517	223	0	636	131	524	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	24.1	19.2	31.8	19.3	15.4	29.0	0.0	12.7	33.7	17.7	17.6
Incr Delay (d2), s/veh	22.3	22.6	0.5	7.7	0.7	0.0	19.9	0.0	0.3	34.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	9.5	1.8	0.9	3.8	0.0	3.7	0.0	0.5	0.1	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.8	46.7	19.7	39.5	19.9	15.4	49.0	0.0	13.0	67.6	17.7	17.7
LnGrp LOS	E	D	B	D	B	B	D	A	B	E	B	B
Approach Vol, veh/h		1632			1072			230			21	
Approach Delay, s/veh		44.0			20.8			40.7			24.9	
Approach LOS		D			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	31.5	7.6	24.0	12.8	23.5	4.9	26.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	22.5	5.0	19.5	8.5	19.0	5.0	19.5
Max Q Clear Time (g_c+I1), s	2.1	3.4	3.9	21.4	8.6	2.3	2.2	13.4
Green Ext Time (p_c), s	0.0	0.2	0.0	0.0	0.0	0.0	0.0	3.0

Intersection Summary	
HCM 6th Ctrl Delay	35.2
HCM 6th LOS	D

Intersection	
Intersection Delay, s/veh	12.2
Intersection LOS	B

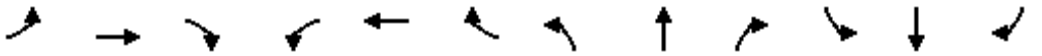
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	159	80	7	127	28	44	171	7	30	163	18
Future Vol, veh/h	18	159	80	7	127	28	44	171	7	30	163	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	173	87	8	138	30	48	186	8	33	177	20
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	11.4	12.4	11.8	13.6
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	10%	0%	4%	14%
Vol Thru, %	0%	96%	90%	0%	78%	77%
Vol Right, %	0%	4%	0%	100%	17%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	44	178	177	80	162	211
LT Vol	44	0	18	0	7	30
Through Vol	0	171	159	0	127	163
RT Vol	0	7	0	80	28	18
Lane Flow Rate	48	193	192	87	176	229
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.09	0.337	0.34	0.135	0.314	0.403
Departure Headway (Hd)	6.807	6.271	6.356	5.594	6.41	6.33
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	525	571	564	638	558	566
Service Time	4.572	4.035	4.117	3.354	4.477	4.393
HCM Lane V/C Ratio	0.091	0.338	0.34	0.136	0.315	0.405
HCM Control Delay	10.3	12.2	12.4	9.2	12.4	13.6
HCM Lane LOS	B	B	B	A	B	B
HCM 95th-tile Q	0.3	1.5	1.5	0.5	1.3	1.9

HCM 6th Signalized Intersection Summary
1: Sanderson Ave & Ramona Expy

05/12/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	448	581	192	60	446	690	207	913	35	934	1705	652
Future Volume (veh/h)	448	581	192	60	446	690	207	913	35	934	1705	652
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	487	632	209	65	485	750	225	992	38	1015	1853	709
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	481	936	520	136	582	687	223	937	480	933	1667	964
Arrive On Green	0.14	0.26	0.26	0.04	0.16	0.16	0.06	0.26	0.26	0.27	0.47	0.47
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	487	632	209	65	485	750	225	992	38	1015	1853	709
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	15.3	17.5	2.8	2.0	14.5	18.0	7.1	29.0	1.9	29.7	51.6	19.6
Cycle Q Clear(g_c), s	15.3	17.5	2.8	2.0	14.5	18.0	7.1	29.0	1.9	29.7	51.6	19.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	481	936	520	136	582	687	223	937	480	933	1667	964
V/C Ratio(X)	1.01	0.67	0.40	0.48	0.83	1.09	1.01	1.06	0.08	1.09	1.11	0.74
Avail Cap(c_a), veh/h	481	936	520	167	582	687	223	937	480	933	1667	964
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.4	36.3	17.7	51.7	44.6	15.3	51.4	40.5	27.4	40.1	29.2	15.3
Incr Delay (d2), s/veh	44.4	1.9	0.5	2.6	10.1	61.8	62.5	46.3	0.3	56.3	59.3	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	7.4	2.9	0.9	6.9	18.2	4.9	17.8	0.7	19.0	32.9	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	91.7	38.2	18.3	54.4	54.7	77.2	114.0	86.8	27.7	96.5	88.5	20.3
LnGrp LOS	F	D	B	D	D	F	F	F	C	F	F	C
Approach Vol, veh/h		1328			1300			1255			3577	
Approach Delay, s/veh		54.7			67.6			89.9			77.2	
Approach LOS		D			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	34.2	33.5	8.8	33.5	11.6	56.1	19.8	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.7	29.0	5.3	28.0	7.1	51.6	15.3	18.0
Max Q Clear Time (g_c+I1), s	31.7	31.0	4.0	19.5	9.1	53.6	17.3	20.0
Green Ext Time (p_c), s	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0

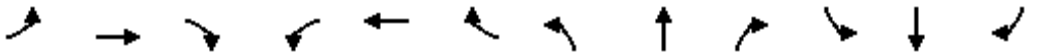
Intersection Summary	
HCM 6th Ctrl Delay	73.7
HCM 6th LOS	E



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	63	169	980	43	332	1603
Future Volume (veh/h)	63	169	980	43	332	1603
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	184	1065	47	361	1742
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	178	159	1489	664	419	2617
Arrive On Green	0.10	0.10	0.42	0.42	0.24	0.74
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	68	184	1065	47	361	1742
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	2.0	5.5	13.7	1.0	10.7	13.9
Cycle Q Clear(g_c), s	2.0	5.5	13.7	1.0	10.7	13.9
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	178	159	1489	664	419	2617
V/C Ratio(X)	0.38	1.16	0.72	0.07	0.86	0.67
Avail Cap(c_a), veh/h	178	159	1489	664	502	2617
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	24.8	13.3	9.6	20.2	3.7
Incr Delay (d2), s/veh	1.3	121.3	3.0	0.2	12.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	7.1	4.3	0.3	4.9	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.5	146.0	16.2	9.8	32.5	5.1
LnGrp LOS	C	F	B	A	C	A
Approach Vol, veh/h	252		1112			2103
Approach Delay, s/veh	113.2		15.9			9.8
Approach LOS	F		B			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	17.5	27.5			45.0	10.0
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	15.5	20.5			40.5	5.5
Max Q Clear Time (g_c+I1), s	12.7	15.7			15.9	7.5
Green Ext Time (p_c), s	0.3	2.7			13.6	0.0

Intersection Summary	
HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1346	151	46	939	1	163	3	46	3	10	6
Future Volume (veh/h)	5	1346	151	46	939	1	163	3	46	3	10	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	1463	164	50	1021	1	177	3	50	3	11	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	12	1468	456	80	1664	517	217	36	600	7	524	444
Arrive On Green	0.01	0.29	0.29	0.04	0.33	0.33	0.12	0.40	0.40	0.00	0.28	0.28
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	1781	91	1508	1781	1870	1585
Grp Volume(v), veh/h	5	1463	164	50	1021	1	177	0	53	3	11	7
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1781	0	1599	1781	1870	1585
Q Serve(g_s), s	0.2	19.4	5.6	1.9	11.4	0.0	6.6	0.0	1.4	0.1	0.3	0.2
Cycle Q Clear(g_c), s	0.2	19.4	5.6	1.9	11.4	0.0	6.6	0.0	1.4	0.1	0.3	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.94	1.00		1.00
Lane Grp Cap(c), veh/h	12	1468	456	80	1664	517	217	0	636	7	524	444
V/C Ratio(X)	0.42	1.00	0.36	0.62	0.61	0.00	0.82	0.00	0.08	0.42	0.02	0.02
Avail Cap(c_a), veh/h	131	1468	456	131	1664	517	223	0	636	131	524	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	24.1	19.2	31.8	19.3	15.4	29.0	0.0	12.7	33.7	17.7	17.6
Incr Delay (d2), s/veh	22.3	22.6	0.5	7.7	0.7	0.0	19.9	0.0	0.3	34.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	9.5	1.8	0.9	3.8	0.0	3.7	0.0	0.5	0.1	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.8	46.7	19.7	39.5	19.9	15.4	49.0	0.0	13.0	67.6	17.7	17.7
LnGrp LOS	E	D	B	D	B	B	D	A	B	E	B	B
Approach Vol, veh/h		1632			1072			230			21	
Approach Delay, s/veh		44.0			20.8			40.7			24.9	
Approach LOS		D			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	31.5	7.6	24.0	12.8	23.5	4.9	26.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	22.5	5.0	19.5	8.5	19.0	5.0	19.5
Max Q Clear Time (g_c+I1), s	2.1	3.4	3.9	21.4	8.6	2.3	2.2	13.4
Green Ext Time (p_c), s	0.0	0.2	0.0	0.0	0.0	0.0	0.0	3.0

Intersection Summary	
HCM 6th Ctrl Delay	35.2
HCM 6th LOS	D

Intersection	
Intersection Delay, s/veh	12.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	159	80	7	127	28	44	171	7	30	163	18
Future Vol, veh/h	18	159	80	7	127	28	44	171	7	30	163	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	173	87	8	138	30	48	186	8	33	177	20
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	11.4	12.4	11.8	13.6
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	10%	0%	4%	14%
Vol Thru, %	0%	96%	90%	0%	78%	77%
Vol Right, %	0%	4%	0%	100%	17%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	44	178	177	80	162	211
LT Vol	44	0	18	0	7	30
Through Vol	0	171	159	0	127	163
RT Vol	0	7	0	80	28	18
Lane Flow Rate	48	193	192	87	176	229
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.09	0.337	0.34	0.135	0.314	0.403
Departure Headway (Hd)	6.807	6.271	6.356	5.594	6.41	6.33
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	525	571	564	638	558	566
Service Time	4.572	4.035	4.117	3.354	4.477	4.393
HCM Lane V/C Ratio	0.091	0.338	0.34	0.136	0.315	0.405
HCM Control Delay	10.3	12.2	12.4	9.2	12.4	13.6
HCM Lane LOS	B	B	B	A	B	B
HCM 95th-tile Q	0.3	1.5	1.5	0.5	1.3	1.9

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	375	28	47	189	17	28
Future Vol, veh/h	375	28	47	189	17	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	140	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	408	30	51	205	18	30

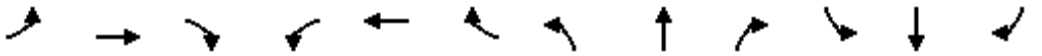
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	438	0	715	408
Stage 1	-	-	-	-	408	-
Stage 2	-	-	-	-	307	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1122	-	397	643
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	746	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1122	-	379	643
Mov Cap-2 Maneuver	-	-	-	-	379	-
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	746	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	509	-	-	1122	-
HCM Lane V/C Ratio	0.096	-	-	0.046	-
HCM Control Delay (s)	12.8	-	-	8.4	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

HCM 6th Signalized Intersection Summary
1: Sanderson Ave & Ramona Expy

05/12/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	457	593	181	61	455	704	203	924	36	952	1725	665
Future Volume (veh/h)	457	593	181	61	455	704	203	924	36	952	1725	665
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	497	645	197	66	495	765	221	1004	39	1035	1875	723
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	481	936	520	136	582	687	223	937	480	933	1667	964
Arrive On Green	0.14	0.26	0.26	0.04	0.16	0.16	0.06	0.26	0.26	0.27	0.47	0.47
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	497	645	197	66	495	765	221	1004	39	1035	1875	723
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	15.3	18.0	2.1	2.1	14.9	18.0	7.0	29.0	1.9	29.7	51.6	20.8
Cycle Q Clear(g_c), s	15.3	18.0	2.1	2.1	14.9	18.0	7.0	29.0	1.9	29.7	51.6	20.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	481	936	520	136	582	687	223	937	480	933	1667	964
V/C Ratio(X)	1.03	0.69	0.38	0.48	0.85	1.11	0.99	1.07	0.08	1.11	1.12	0.75
Avail Cap(c_a), veh/h	481	936	520	167	582	687	223	937	480	933	1667	964
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.4	36.5	17.3	51.7	44.7	15.3	51.4	40.5	27.4	40.1	29.2	15.5
Incr Delay (d2), s/veh	50.1	2.2	0.5	2.7	11.6	69.7	57.5	50.6	0.3	64.2	64.6	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	7.6	2.7	0.9	7.1	19.7	4.7	18.3	0.7	20.0	34.1	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.4	38.6	17.8	54.4	56.3	85.0	108.9	91.1	27.7	104.3	93.8	20.9
LnGrp LOS	F	D	B	D	E	F	F	F	C	F	F	C
Approach Vol, veh/h		1339			1326			1264			3633	
Approach Delay, s/veh		57.4			72.8			92.2			82.3	
Approach LOS		E			E			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	34.2	33.5	8.8	33.5	11.6	56.1	19.8	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.7	29.0	5.3	28.0	7.1	51.6	15.3	18.0
Max Q Clear Time (g_c+I1), s	31.7	31.0	4.1	20.0	9.0	53.6	17.3	20.0
Green Ext Time (p_c), s	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0

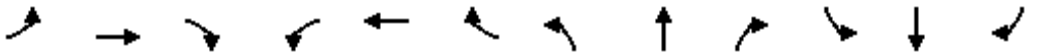
Intersection Summary	
HCM 6th Ctrl Delay	77.9
HCM 6th LOS	E



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	64	172	999	44	339	1635
Future Volume (veh/h)	64	172	999	44	339	1635
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	70	187	1086	48	368	1777
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	178	159	1476	658	426	2617
Arrive On Green	0.10	0.10	0.42	0.42	0.24	0.74
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	70	187	1086	48	368	1777
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	2.0	5.5	14.2	1.0	10.9	14.5
Cycle Q Clear(g_c), s	2.0	5.5	14.2	1.0	10.9	14.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	178	159	1476	658	426	2617
V/C Ratio(X)	0.39	1.18	0.74	0.07	0.86	0.68
Avail Cap(c_a), veh/h	178	159	1476	658	502	2617
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	24.8	13.5	9.7	20.1	3.8
Incr Delay (d2), s/veh	1.4	128.0	3.3	0.2	12.9	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	7.4	4.5	0.3	5.1	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.6	152.7	16.8	9.9	32.9	5.3
LnGrp LOS	C	F	B	A	C	A
Approach Vol, veh/h	257		1134			2145
Approach Delay, s/veh	117.8		16.5			10.0
Approach LOS	F		B			B

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	17.7	27.3			45.0	10.0
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	15.5	20.5			40.5	5.5
Max Q Clear Time (g_c+I1), s	12.9	16.2			16.5	7.5
Green Ext Time (p_c), s	0.3	2.5			13.8	0.0

Intersection Summary	
HCM 6th Ctrl Delay	19.9
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1373	154	47	958	1	167	3	47	3	10	6
Future Volume (veh/h)	5	1373	154	47	958	1	167	3	47	3	10	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	1492	167	51	1041	1	182	3	51	3	11	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	12	1462	454	81	1660	515	222	36	604	7	522	442
Arrive On Green	0.01	0.29	0.29	0.05	0.33	0.33	0.12	0.40	0.40	0.00	0.28	0.28
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	1781	89	1510	1781	1870	1585
Grp Volume(v), veh/h	5	1492	167	51	1041	1	182	0	54	3	11	7
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1781	0	1599	1781	1870	1585
Q Serve(g_s), s	0.2	19.5	5.7	1.9	11.8	0.0	6.8	0.0	1.4	0.1	0.3	0.2
Cycle Q Clear(g_c), s	0.2	19.5	5.7	1.9	11.8	0.0	6.8	0.0	1.4	0.1	0.3	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.94	1.00		1.00
Lane Grp Cap(c), veh/h	12	1462	454	81	1660	515	222	0	639	7	522	442
V/C Ratio(X)	0.42	1.02	0.37	0.63	0.63	0.00	0.82	0.00	0.08	0.42	0.02	0.02
Avail Cap(c_a), veh/h	131	1462	454	131	1660	515	222	0	639	131	522	442
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	24.3	19.4	31.9	19.5	15.5	29.0	0.0	12.7	33.8	17.8	17.8
Incr Delay (d2), s/veh	22.3	28.8	0.5	7.8	0.8	0.0	20.8	0.0	0.3	34.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	10.4	1.8	0.9	3.9	0.0	3.9	0.0	0.5	0.1	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.0	53.1	19.9	39.8	20.2	15.5	49.9	0.0	13.0	67.8	17.9	17.8
LnGrp LOS	E	F	B	D	C	B	D	A	B	E	B	B
Approach Vol, veh/h		1664			1093			236			21	
Approach Delay, s/veh		49.8			21.1			41.4			25.0	
Approach LOS		D			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	31.7	7.6	24.0	13.0	23.5	5.0	26.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	22.5	5.0	19.5	8.5	19.0	5.0	19.5
Max Q Clear Time (g_c+I1), s	2.1	3.4	3.9	21.5	8.8	2.3	2.2	13.8
Green Ext Time (p_c), s	0.0	0.2	0.0	0.0	0.0	0.0	0.0	3.0

Intersection Summary			
HCM 6th Ctrl Delay		38.6	
HCM 6th LOS		D	

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

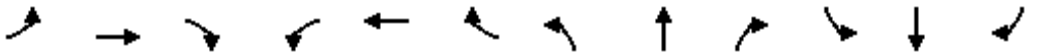
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	162	82	7	130	29	45	175	7	31	167	18
Future Vol, veh/h	18	162	82	7	130	29	45	175	7	31	167	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	176	89	8	141	32	49	190	8	34	182	20
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	11.6	12.6	12.1	14
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	10%	0%	4%	14%
Vol Thru, %	0%	96%	90%	0%	78%	77%
Vol Right, %	0%	4%	0%	100%	17%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	45	182	180	82	166	216
LT Vol	45	0	18	0	7	31
Through Vol	0	175	162	0	130	167
RT Vol	0	7	0	82	29	18
Lane Flow Rate	49	198	196	89	180	235
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.093	0.348	0.348	0.14	0.324	0.416
Departure Headway (Hd)	6.863	6.327	6.411	5.649	6.468	6.386
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	520	566	560	631	554	561
Service Time	4.628	4.092	4.177	3.414	4.541	4.451
HCM Lane V/C Ratio	0.094	0.35	0.35	0.141	0.325	0.419
HCM Control Delay	10.3	12.5	12.6	9.3	12.6	14
HCM Lane LOS	B	B	B	A	B	B
HCM 95th-tile Q	0.3	1.5	1.5	0.5	1.4	2

HCM 6th Signalized Intersection Summary
1: Sanderson Ave & Ramona Expy

05/12/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	457	593	199	61	455	704	214	935	36	952	1743	665
Future Volume (veh/h)	457	593	199	61	455	704	214	935	36	952	1743	665
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	497	645	216	66	495	765	233	1016	39	1035	1895	723
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	481	936	520	136	582	687	223	937	480	933	1667	964
Arrive On Green	0.14	0.26	0.26	0.04	0.16	0.16	0.06	0.26	0.26	0.27	0.47	0.47
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	497	645	216	66	495	765	233	1016	39	1035	1895	723
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	15.3	18.0	3.1	2.1	14.9	18.0	7.1	29.0	1.9	29.7	51.6	20.8
Cycle Q Clear(g_c), s	15.3	18.0	3.1	2.1	14.9	18.0	7.1	29.0	1.9	29.7	51.6	20.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	481	936	520	136	582	687	223	937	480	933	1667	964
V/C Ratio(X)	1.03	0.69	0.42	0.48	0.85	1.11	1.04	1.08	0.08	1.11	1.14	0.75
Avail Cap(c_a), veh/h	481	936	520	167	582	687	223	937	480	933	1667	964
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.4	36.5	18.0	51.7	44.7	15.3	51.4	40.5	27.4	40.1	29.2	15.5
Incr Delay (d2), s/veh	50.1	2.2	0.5	2.7	11.6	69.7	72.4	55.0	0.3	64.2	69.5	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	7.6	3.0	0.9	7.1	19.7	5.2	18.9	0.7	20.0	35.3	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.4	38.6	18.5	54.4	56.3	85.0	123.9	95.5	27.7	104.3	98.7	20.9
LnGrp LOS	F	D	B	D	E	F	F	F	C	F	F	C
Approach Vol, veh/h		1358			1326			1288			3653	
Approach Delay, s/veh		57.0			72.8			98.6			84.9	
Approach LOS		E			E			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	34.2	33.5	8.8	33.5	11.6	56.1	19.8	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.7	29.0	5.3	28.0	7.1	51.6	15.3	18.0
Max Q Clear Time (g_c+I1), s	31.7	31.0	4.1	20.0	9.1	53.6	17.3	20.0
Green Ext Time (p_c), s	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0

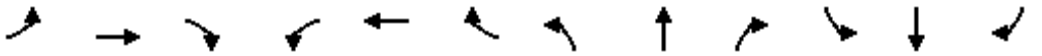
Intersection Summary	
HCM 6th Ctrl Delay	80.1
HCM 6th LOS	F



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	64	187	1006	44	363	1647
Future Volume (veh/h)	64	187	1006	44	363	1647
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	70	203	1093	48	395	1790
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	178	159	1427	636	451	2617
Arrive On Green	0.10	0.10	0.40	0.40	0.25	0.74
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	70	203	1093	48	395	1790
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	2.0	5.5	14.6	1.0	11.7	14.7
Cycle Q Clear(g_c), s	2.0	5.5	14.6	1.0	11.7	14.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	178	159	1427	636	451	2617
V/C Ratio(X)	0.39	1.28	0.77	0.08	0.88	0.68
Avail Cap(c_a), veh/h	178	159	1427	636	502	2617
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	24.8	14.2	10.2	19.7	3.9
Incr Delay (d2), s/veh	1.4	165.8	4.0	0.2	14.9	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	9.1	4.9	0.3	5.6	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.6	190.5	18.2	10.4	34.6	5.3
LnGrp LOS	C	F	B	B	C	A
Approach Vol, veh/h	273		1141			2185
Approach Delay, s/veh	148.0		17.9			10.6
Approach LOS	F		B			B

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	18.4	26.6			45.0	10.0
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	15.5	20.5			40.5	5.5
Max Q Clear Time (g_c+I1), s	13.7	16.6			16.7	7.5
Green Ext Time (p_c), s	0.2	2.3			13.9	0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1373	154	59	958	1	167	3	54	3	10	6
Future Volume (veh/h)	5	1373	154	59	958	1	167	3	54	3	10	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	1492	167	64	1041	1	182	3	59	3	11	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	12	1453	451	92	1682	522	221	31	604	7	519	440
Arrive On Green	0.01	0.28	0.28	0.05	0.33	0.33	0.12	0.40	0.40	0.00	0.28	0.28
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	1781	77	1520	1781	1870	1585
Grp Volume(v), veh/h	5	1492	167	64	1041	1	182	0	62	3	11	7
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1781	0	1597	1781	1870	1585
Q Serve(g_s), s	0.2	19.5	5.8	2.4	11.8	0.0	6.8	0.0	1.7	0.1	0.3	0.2
Cycle Q Clear(g_c), s	0.2	19.5	5.8	2.4	11.8	0.0	6.8	0.0	1.7	0.1	0.3	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.95	1.00		1.00
Lane Grp Cap(c), veh/h	12	1453	451	92	1682	522	221	0	634	7	519	440
V/C Ratio(X)	0.42	1.03	0.37	0.70	0.62	0.00	0.82	0.00	0.10	0.42	0.02	0.02
Avail Cap(c_a), veh/h	130	1453	451	130	1682	522	221	0	634	130	519	440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	24.5	19.6	32.0	19.4	15.4	29.3	0.0	12.9	34.0	18.0	18.0
Incr Delay (d2), s/veh	22.3	30.7	0.5	9.2	0.7	0.0	21.6	0.0	0.3	34.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	10.6	1.9	1.2	3.9	0.0	4.0	0.0	0.6	0.1	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.2	55.2	20.1	41.2	20.1	15.4	50.9	0.0	13.3	68.0	18.1	18.0
LnGrp LOS	E	F	C	D	C	B	D	A	B	E	B	B
Approach Vol, veh/h		1664			1106			244			21	
Approach Delay, s/veh		51.7			21.3			41.3			25.2	
Approach LOS		D			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	31.7	8.0	24.0	13.0	23.5	5.0	27.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	22.5	5.0	19.5	8.5	19.0	5.0	19.5
Max Q Clear Time (g_c+I1), s	2.1	3.7	4.4	21.5	8.8	2.3	2.2	13.8
Green Ext Time (p_c), s	0.0	0.2	0.0	0.0	0.0	0.0	0.0	3.0

Intersection Summary			
HCM 6th Ctrl Delay		39.6	
HCM 6th LOS		D	

Intersection	
Intersection Delay, s/veh	13.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	176	89	7	154	29	57	175	7	31	167	30
Future Vol, veh/h	26	176	89	7	154	29	57	175	7	31	167	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	28	191	97	8	167	32	62	190	8	34	182	33
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	12.6	13.9	12.6	15.2
HCM LOS	B	B	B	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	13%	0%	4%	14%
Vol Thru, %	0%	96%	87%	0%	81%	73%
Vol Right, %	0%	4%	0%	100%	15%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	57	182	202	89	190	228
LT Vol	57	0	26	0	7	31
Through Vol	0	175	176	0	154	167
RT Vol	0	7	0	89	29	30
Lane Flow Rate	62	198	220	97	207	248
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.123	0.362	0.404	0.157	0.383	0.455
Departure Headway (Hd)	7.126	6.589	6.617	5.839	6.685	6.612
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	500	542	540	608	533	540
Service Time	4.918	4.381	4.405	3.626	4.783	4.704
HCM Lane V/C Ratio	0.124	0.365	0.407	0.16	0.388	0.459
HCM Control Delay	10.9	13.1	13.9	9.7	13.9	15.2
HCM Lane LOS	B	B	B	A	B	C
HCM 95th-tile Q	0.4	1.6	1.9	0.6	1.8	2.4

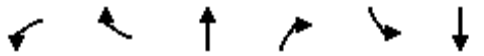
Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	383	24	49	193	14	29
Future Vol, veh/h	383	24	49	193	14	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	140	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	416	26	53	210	15	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	442	0	732	416
Stage 1	-	-	-	-	416	-
Stage 2	-	-	-	-	316	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1118	-	388	637
Stage 1	-	-	-	-	666	-
Stage 2	-	-	-	-	739	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1118	-	370	637
Mov Cap-2 Maneuver	-	-	-	-	370	-
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	739	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	516	-	-	1118	-
HCM Lane V/C Ratio	0.091	-	-	0.048	-
HCM Control Delay (s)	12.7	-	-	8.4	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	21	7	999	37	12	1699
Future Volume (veh/h)	21	7	999	37	12	1699
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	23	8	1086	40	13	1847
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	2	2	2	2
Cap, veh/h	0	0	1900	70	31	2773
Arrive On Green	0.00	0.00	0.54	0.54	0.02	0.78
Sat Flow, veh/h	0	0	3589	129	1781	3647
Grp Volume(v), veh/h	0	0	552	574	13	1847
Grp Sat Flow(s),veh/h/ln	0	0	1777	1847	1781	1777
Q Serve(g_s), s	0.0	0.0	4.2	4.2	0.1	4.9
Cycle Q Clear(g_c), s	0.0	0.0	4.2	4.2	0.1	4.9
Prop In Lane	0.00	0.00		0.07	1.00	
Lane Grp Cap(c), veh/h	0	0	966	1004	31	2773
V/C Ratio(X)	0.00	0.00	0.57	0.57	0.42	0.67
Avail Cap(c_a), veh/h	0	0	1561	1622	435	3121
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	3.1	3.1	10.0	1.0
Incr Delay (d2), s/veh	0.0	0.0	0.5	0.5	8.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	0.1	0.1	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	3.6	3.6	18.7	1.5
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	0		1126			1860
Approach Delay, s/veh	0.0		3.6			1.6
Approach LOS			A			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	4.9	15.6			20.5	0.0
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	5.0	18.0			18.0	18.0
Max Q Clear Time (g_c+I1), s	2.1	6.2			6.9	0.0
Green Ext Time (p_c), s	0.0	4.9			8.3	0.0

Intersection Summary	
HCM 6th Ctrl Delay	2.4
HCM 6th LOS	A

APPENDIX F – FEMA LETTER OF MAP REVISION

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Federal Emergency Management Agency

Washington, D.C. 20472

June 27, 2022

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Jeff Hewitt
Chair, Board of Supervisors
Riverside County
4080 Lemon Street, 5th Floor
Riverside, CA 92502

IN REPLY REFER TO:
Case No.: 21-09-1682P
Community Name: Riverside County, CA
Community No.: 060245
Effective Date of
This Revision: **November 9, 2022**

Dear Chair Hewitt:

The Flood Insurance Study Report and Flood Insurance Rate Map for your community have been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Oakland, California, at (510) 627-7211, or the FEMA Mapping and Insurance eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at https://www.fema.gov/flood-insurance.

Sincerely,

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map
Annotated Flood Insurance Study Report

cc: The Honorable Crystal Ruiz
Mayor, City of San Jacinto

Hilal El Haddad, MS, P.E., CFM
Senior Civil Engineer
Riverside County Flood Control and Water Conservation District

Stuart McKibben, P.E.
City Engineer
City of San Jacinto

Joseph Caldwell, P.E., CPSWQ, CPESC, CFM
Water Resources Practice Leader
Albert A. Webb Associates