CITY OF SAN BERNARDINO
FINAL INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

TEC Equipment
776 W Mill Street

Project Description and Location:

TEC Equipment, Inc (Applicant) is requesting the City of San Bernardino's approval of a Land Use Permit for a proposed truck sales, service/repair, and parts sales dealership on an approximately 7-acre site containing a total of five Assessor's Parcel Numbers (0136-151-06, 09, 11, and 19 & 0136-142-02). The Project Site is located at 776 W Mill Street. The development proposed is the establishment of a truck sales and service/repair, and parts sales dealership to include a 5,950 square-foot (sf) office building, 168 12-foot by 55-foot trailer truck stalls, 21 12-foot by 30-foot truck stalls and seven passenger car parking spaces. The proposed site improvements include signage, landscaping, decorative perimeter fencing/walls, and a storm water retention basin. The improvements also include easement dedication along the northern and southern property lines. Access to the Project Site is provided by an existing 40-foot driveway on Mill Street.

December 2021

LEAD AGENCY:

City of San Bernardino
Community and Economic Development Department, Planning Division
Michael Rosales, Associate Planner
909-384-5930
Rosales_Mi@sbcity.org
201 North "E" Street, 3rd Floor
San Bernardino, CA 92401

PREPARED BY:

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1905 Business Center Drive
San Bernardino, CA 92408
909-890-1818

PREPARED FOR:

TEC Equipment, Inc.
750 NE Columbia Blvd.
Portland, OR 97211

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The California Environmental Quality Act (CEQA) requires the preparation of an Initial Study when a proposal must obtain discretionary approval from a governmental agency and is not exempt from CEQA. The purpose of the Initial Study is to determine whether or not a proposal, not exempt from CEQA, qualifies for a Negative Declaration or if an Environmental Impact Report (EIR) must be prepared.

1. **Project Title:** TEC Equipment

2. **Lead Agency:** City of San Bernardino
Office: 201 North "E" Street, 3rd Floor, San Bernardino, California 92401
Mailing: 290 North "D" Street, San Bernardino, California 92401

3. **Lead Agency Contact Person and Phone Number:** Michael Rosales, Associate Planner
909-384-7272, Rosales_Mi@sbcity.org

4. **Project Location (Address/Nearest cross-streets):**

The Project site is located at 776 W Mill Street, in the City of San Bernardino.

<u>Regional Location</u>:

The City is located approximately 60 miles east of the City of Los Angeles. The City of San Bernardino is surrounded by the cities of Rialto to the west, Colton to the southwest, Loma Linda to the south, Redlands to the southeast, Highland to the east, and the San Bernardino National Forest to the north; refer to Figure 1 - Regional Location.

<u>Project Site Location</u>:

The Proposed Project site is comprised of five (5) parcels on a 7.08-acre site. The Proposed Project site is in the south-central portion of the City and located at 776 W Mill Street, in the City of San Bernardino. The Project Site is bounded by the Lytle Creek Flood Control Channel to the north and east, Mill Street and commercial uses to the south, and Interstate 215 to the west. See Figure 2 - Project Vicinity.

5. **Project Applicant(s)/Sponsor(s) Name and Address:**

TEC Equipment, Inc.
750 NE Columbia Blvd.
Portland, OR 97211

Joseph E. Bonadiman & Associates, Inc.
234 N. Arrowhead Avenue
San Bernardino, CA 92408
(909) 885-3806

6. **Existing General Plan Designation:** C (Commercial)

7. **Existing Zoning Designation:** CCS-1(Central City South-1)

8. Description of Project (Describe the whole action involved, including, but not limited to later phases of the project and any secondary, support, or off-site feature necessary for its implementation. Attach additional sheets if necessary):

TEC Equipment, Inc (Applicant) is requesting the City of San Bernardino's approval of a Land Use Permit for a proposed truck sales, service/repair, and parts sales dealership on an approximately 7-acre site containing a total of five Assessor's Parcel Numbers (0136-151-06, 09, 11, and 19 & 0136-142-02). The Project Site is located at 776 W Mill Street. The development proposed is the establishment of a truck sales and service/repair, and parts sales dealership to include a 5,950 square-foot (sf) office building, 168 12-foot by 55-foot trailer truck stalls, 21 12-foot by 30-foot truck stalls and seven passenger car parking spaces (see Figure 3 – Site Plan). The proposed site improvements include signage, landscaping, decorative perimeter fencing/walls, and a storm water retention basin. The improvements also include easement dedication along the northern and southern property lines. Access to the Project Site is provided by an existing 40-foot driveway on Mill Street.

The Project Site has been previously disturbed. There are two (2) radio towers with underground radial grounding systems along with transmission power lines crossing the Project Site. The Project Site has been graded as part of the I-215 interstate on-ramp and the regional flood control channel developments.

9. Surrounding land uses and setting: Briefly describe the project's surroundings:

The 7.0 acres Project site will provide ingress and egress access by an existing 40-foot driveway located at the southern portion of the site along Mill Street. Surrounding land uses include: Lytle Creek Flood Control Channel to the north and east, Mill Street and commercial uses to the south, and Interstate 215 to the west. Table 1 provides the General Plan and zoning designations for the surrounding properties:

Table 1
Existing General Plan and Zoning Designations

Location	General Plan Designation	Zoning Designation
Site	C (Commercial)	CCS-1(Central City South-1)
North	PF (Public Facility/Quasi-Public)	PFC (Publicly Owned Flood Control)
South	I (Industrial); C (Commercial)	IL (Industrial Light); CCS-2 (Central City South-2)
East	PF (Public Facility/Quasi-Public)	PFC (Publicly Owned Flood Control)
West	Interstate 215	Interstate 215

The Project Site has a General Plan land use designation of C (Commercial) and is zoned CCS-1(Central City South-1). The CG land use designation is defined as local and regional serving retail, personal service, entertainment, office, related commercial uses and limited residential uses with a CUP.[1] The Project Site is within the CCS-1(Central City South-1) zone area as shown on City of San Bernardino Public Zoning Map (accessed 10/20/2021). Intended uses within this zoning designation include local and regional serving retail and service uses. As such, the proposed Project is consistent with the existing General Plan land use and Zoning designations.

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[1] City of San Bernardino General Plan, Figure LU-2: General Plan Land Use Map, and Table LU-2: Land Use Designations. http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Pages: 2-13 and 2-19

10. Other agencies whose approval is required (e.g., permits, finance approval, or participation agreement):

- City of San Bernardino Approval of Grading and Building Permits
- Santa Ana Regional Water Quality Control Board, NPDES authorization

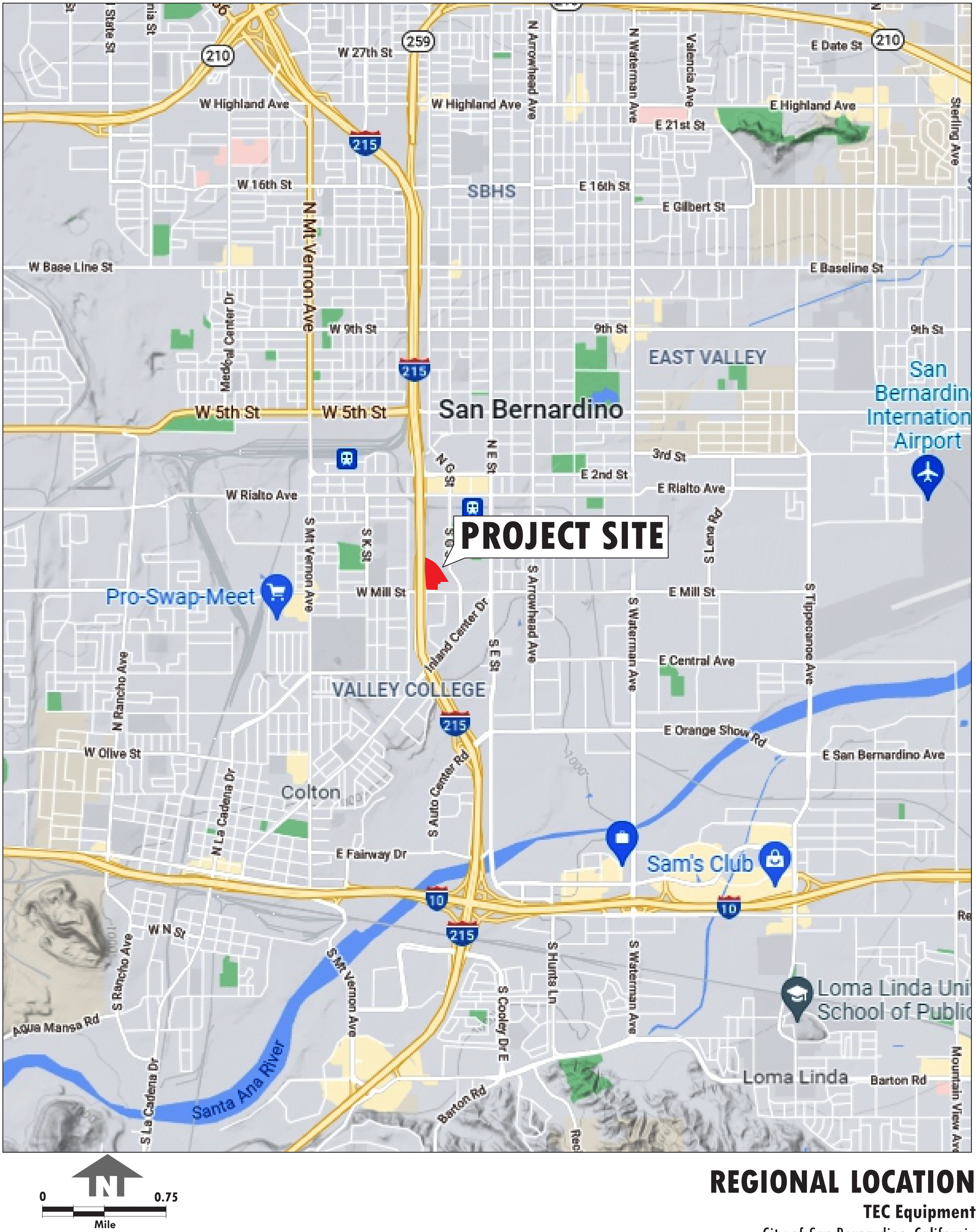
11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentially, etc.?

On June 29, 2021, following determination of a complete Project Application, the City of San Bernardino contacted representatives of the following tribes: Gabrieleño Band of Mission Indians - Kizh Nation, San Manuel Band of Mission Indians, and Soboba Band of Luiseño Indians. The City of San Bernardino received one response from the San Manuel Band of Mission Indians**.** The City of San Bernardino required that the consulting archaeologist for the project submit a Cultural Resources Pre-Grade Test Plan (CRTP) to stipulate the procedures to be followed to conduct a presence/absence testing prior to the initiation of grading of the property. The CRTP was requested by the San Manuel Band of Mission Indians (Tribe) as a means to determine if Native American monitoring was necessary given the disturbed status of the property.

The purpose the October 14, 2021 archaeological test investigation was to implement the pre-grading subsurface testing at the project as outlined in the approved Cultural Resources Pre-Grade Test Plan. To gather sufficient information to formulate an assessment of the potential for Native American sites within the property, seven short backhoe trenches were excavated at pre-determined locations across the property. The screening process was monitored by representatives of the San Manuel Band of Mission Indians.

The excavation of the seven backhoe trenches resulted in the conclusion that no Native American archaeological deposits, artifacts, or features are located within this property. All of the seven trenches produced modern and historic glass fragments within the recovery. No prehistoric resources were identified. Based upon the information from the field investigation, there did not appear to be any evidence of prehistoric Native American use of the Project Site. The soil observed during the trenching was typically light brown, loose to moderately compacted sandy material with evidence of alluvial cobbles. In conclusion, the trenches excavated within the project did not include the observation of any cultural deposits.

12. Response to Comments/Final Initial Study. Attachment A is the City's Notice of Intent to Adopt a Negative Declaration. Responses to any comments received are pending completion of the Public Review and will be included as Attachment B to the Final Initial Study.



Source: Lilburn Corp., October, 2021.

LILBURN
CORPORATION

REGIONAL LOCATION

TEC Equipment

City of San Bernardino, California

FIGURE 1

Source: Lilburn Corp., October, 2021.

LILBURN
CORPORATION

PROJECT VICINITY

TEC Equipment

City of San Bernardino, California

FIGURE 2

PRELIMINARY GRADING PLAN
776 W MILL STREET
IN THE CITY OF SAN BERNARDINO, CALIFORNIA

FLOOD ZONE NOTE:

NATIONAL FLOOD INSURANCE PROGRAM

PER FEMA FIRM PANEL NO. 06071C8681J, & 06071C8683J (EFFECTIVE DATE – SEPTEMBER 2, 2016), THE PROJECT SITE IS LOCATED WITHIN SHADED ZONE X ("AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM THE 1% ANNUAL CHANCE FLOOD").

BUILDING SETBACK:

FRONT:	10'
REAR:	0'
SIDE:	0'
HEIGHT:	30'
LOT COVERAGE:	50%

DATA DERIVED FROM CITY OF SAN BERNARDINO DEVELOPMENT CODE 19.06.030 TABLE 06.02.

PARCEL COVERAGE:

SUBJECT	EXISTING	%	PROPOSED	%
BUILDING	0 SF.	0%	5,950 SF.	2.0%
HARDSCAPE	0 SF.	0%	234,445 SF.	76.0%
LANDSCAPE/NATIVE	308,319 SF.	100%	67,924 SF.	22.0%
TOTALS			308,319 SF.	100% (7.08 AC.)

PROJECT INFORMATION

ASSESSOR'S PARCEL NO:	0136–151–06, 09, 11, 19 & 0136–142–02
GROSS ACREAGE:	308,316 SF / 7.08 AC
APPROX. TOTAL NET:	308,319 SF / 7.08 AC
EXISTING ZONING:	CCS–1, CENTRAL CITY SOUTH
PROPOSED ZONING:	CCS–1, CENTRAL CITY SOUTH
EXISTING LAND USE:	VACANT
PROPOSED LAND USE:	TRUCKING & TRAILER SALES
CABLE	AT&T (800) 331–0500
WATER PURVEYOR:	CITY OF SAN BERNARDINO (909) 383–5381
SEWER PURVEYOR:	CITY OF SAN BERNARDINO (909) 383–5381
GAS PURVEYOR:	SOUTHERN CALIFORNIA GAS CO. (909) 335–7793
ELECTRICITY PURVEYOR:	SOUTHERN CALIFORNIA EDISON (909) 793–2061
TELEPHONE PURVEYOR:	GENERAL TELEPHONE (909) 797–8277

LEGEND

AC	ASPHALTIC CONCRETE SURFACE
BVC	BEGIN VERTICAL CURVE
CL	CENTER LINE
EVC	END OF VERTICAL CURVE
FF	FINISH FLOOR
FG	FINISH GRADE
FL	FLOWLINE
FS	FINISHED SURFACE
GB	GRADE BREAK
GW	GUY WIRE
INV	INVERT OF PIPE
MH	MANHOLE
NTS	NOT TO SCALE
PP	POWER POLE
PIP	PROTECT IN PLACE
TC	TOP OF CURB
TF	TOP OF FOOTING
TW	TOP OF WALL
TYP	TYPICAL
WI	WROUGHT IRON

▨	EXISTING CONCRETE SURFACE
▨	PROPOSED CONCRETE SURFACE
▢	PROPOSED AC PAVEMENT
— - - —	RIGHT OF WAY
——	PROPERTY LINE
— — —	CENTERLINE
━━	EXISTING BLOCK OR STONE WALL
– – –>– – –>– – –>–	FLOWLINE
┬┬┬	FILL SLOPE
→	INDICATES DIRECTION OF FLOW
– –(1500)– –	CONTOUR ELEVATION (FEET)

PARKING:

CAR (9'X18'):	7 SPACES
TRUCK (11.5'X30):	19 SPACES
TRAILER (11.5'X55'):	168 SPACES
TOTAL:	194 SPACES

EARTHWORK QUANTITIES:

CONSTRUCTION MAY VARY.

CUT 7,268 CUBIC YARDS
FILL 8,602 CUBIC YARDS

EARTH WORK QUANTITIES NOTE: THE ABOVE LISTED QUANTITIES REFLECT THE ENGINEER'S ESTIMATE OF THE ACTUAL VOLUMES OF MATERIAL CUT AND FILLED. THESE QUANTITIES ARE FOR ESTIMATING AND BONDING PURPOSE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR COMPUTING HIS OWN QUANTITIES FOR CONTRACT PURPOSES.

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PRELIMINARY GRADING PLAN
776 W MILL STREET
CITY OF SAN BERNARDINO, CA 92408
APN: 0136-151-06, 09, 11, 19 & 0136-142-02

REVISIONS

NO	DESCRIPTION	BY	APPROVED	DATE

PREPARED FOR:	TEC DEVELOPMENT			
DRAWN BY: JTS	SCALE: 1" = 40'	SHEET: 1 OF 1	SP1	
CHECKED BY: JTS	JOB NO: 204828			
DISREGARD PRINTS BEARING EARLIER REVISION DATES ➡	10-25-21			

SITE PLAN

TEC Equipment

City of San Bernardino, California

LILBURN
CORPORATION

FIGURE 3

INITIAL STUDY/ENVIRONMENTAL CHECKLIST

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

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

On the basis of this Initial Study, the City of San Bernardino Development/Environmental Review Committee (D/ERC) finds:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect 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 on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" 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 (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Michael Rosales, Associate Planner

Signature

12/20/21

Date

Evaluation of Environmental Impacts:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (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).

2) All answers must take account of 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.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level.

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analysis Used. Identify and state where they are available for review.

   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

   a) the significance criteria or threshold, if any, used to evaluate each question; and
   b) the mitigation measure identified, if any, to reduce the impact to less than significance

I. AESTHETICS – Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Discussion:

a) **Less than Significant Impact.** The Proposed Project is the development of a truck sales and service/repair, and parts sales dealership on an approximately 7-acre site. The Project Site is located at 776 W Mill Street and currently contains two radio towers that are approximately 210 feet in height. The City of San Bernardino's General Plan identifies the San Bernardino Mountains and Santa Ana River as scenic resources.[2] The Proposed Project includes a 448 square-foot single-story security office structure. The structure's height will be a maximum of 26 feet and will be comparable to nearby buildings. Truck trailers on-site for sales or repair would have a maximum height of 14 feet and would be below the height of nearby structures. Therefore, the development of the Proposed Project would not impact views of the mountains. The Project Site is not located within a scenic vista nor does it contain scenic resources. Additionally, the proposed use would be consistent with the City's CCS-1(Commercial Central City South-1) zoning designation. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

b) **Less than Significant Impact.** The Project Site is not adjacent to or in the vicinity of a designated State scenic highway nor is it near any State scenic highway corridor. The nearest State scenic highway to the Project Site is a portion of State Route 30, located approximately 5.0 miles east. Additionally, the City General Plan does not identify any scenic resources on or adjacent to the Project Site. No rock outcroppings currently exist on-site. There are several trees throughout the Project Site. As such, the Proposed Project shall adhere to the Chapter 19.28.100 "Removal or Destruction of Trees" of the San Bernardino City Municipal Code to ensure less than significant impacts occur. With adherence to the Municipal Code, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

c) **Less than Significant Impact.** The Project Site is located east of I-215 and north Mill Street at 776 W Mill Street; there are currently two 210-foot tall radio towers on-site. The Proposed Project includes a truck sales and service/repair, and parts sales dealership on a 7-acre site. The proposed use would be compatible with surrounding development and therefore would not degrade the

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[2] City of San Bernardino General Plan http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Page 1-2.

visual quality of the area. The proposed security structure would be approximately 26-feet in height and the truck trailers parked on the Project Site for sales or repair would be approximately 14-feet in height. The proposed site structures would therefore, be lower in height compared to the on-site radio towers and commercial development buildings adjacent to the Project Site. The Proposed Project would not block or degrade any public views and occurs within an area designated CCS-1; and therefore, would be consistent with the General Plan. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

d) **Less than Significant Impact.** The Proposed Project would not generate a significant amount of light and glare when compared to the surrounding area, which includes existing lighting from urban development including streetlights, freeway lights, commercial uses, and vehicles. The design and placement of light fixtures would be shown on site plans, which would be reviewed for consistency with City standards and subject to City-approval. Standards require shielding, diffusing, or indirect lighting to avoid glare. Lighting would be selected and located to confine the area of illumination to the Project Site. Lighting would be consistent with adjacent development in the surrounding area. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
II. AGRICULTURAL/FORESTRY RESOURCES - 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 a non-agricultural 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 in Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Gov't Code Section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conservation 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?	☐	☐	☐	☒

Discussion:

a) **No Impact.** No prime farmland, unique farmland, or farmland of statewide importance occurs at the Project Site or in its vicinity. The Project Site is mapped within California Department of Conservation Farmland Mapping and Monitoring Program Map and Statistical Data Tool "California Important Farmland Finder" (accessed 9/5/2021).[3] The Project Site occurs within an area that is identified as "Urban and Built-Up Land" and according to the California Department of Conservation, it is land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. Lands in this category are used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes. Therefore, no impacts are identified or anticipated and no mitigation measures are required.

b) **No Impact.** The Project Site is not under a Williamson Act Contract as identified in the most recent maps prepared by the County of San Bernardino County including Figure NR-5 Agricultural

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[3] California Important Farmland Finer. https://maps.conservation.ca.gov/dlrp/ciff/. Accessed September 5, 2021.

Resources (accessed 9/5/2021).[4] Additionally, the City of San Bernardino's General Plan does not designate any of the land within the Project Site or in its immediate vicinity for agricultural use. Therefore, no impacts are identified or anticipated, and no mitigation measures are required.

c) **No Impact.** The Project Site does not support existing agricultural uses and no agricultural uses occur within the Project's vicinity. Implementation of the Proposed Project, including the end use of a truck sales and service/repair, and parts sales dealership, would not result in the conversion of farmland to non-farmland use. Therefore, no impacts are identified or anticipated, and no mitigation measures are required.

d, e) **No impact.** The Project Site does not support forest land nor does the Project Site support farmland. Implementation of the Proposed Project would not convert forest land to non-forest use or farmland to non-agricultural use. Therefore, no impacts are identified or anticipated and no mitigation measures are required.

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[4] County of San Bernardino: NR-5 Agricultural Resources https://www.arcgis.com/apps/webappviewer/index.html?id=fcb9bc427d2a4c5a981f97547a0e3688. Accessed September 5,2021.

III. **AIR QUALITY** – Would the project:

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Result in a cumulatively considerable increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
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?	☐	☐	☒	☐

Discussion:

a) **Less than Significant Impact.** The Project Site is located in the South Coast Air Basin (SCAB). The South Coast Air Quality Management District (SCAQMD) has jurisdiction over air quality issues and regulations within the SCAB. The Air Quality Management Plan (AQMP) for the basin establishes a program of rules and regulations administered by SCAQMD to obtain attainment of the state and federal air quality standards. The most recent AQMP (AQMP 2016) was adopted by the SCAQMD on March 3, 2017. The 2016 AQMP incorporates the latest scientific and technological information and planning assumptions, including transportation control measures developed by the Southern California Association of Governments (SCAG) from the 2016 Regional Transportation Plan/Sustainable Communities Strategy, and updated emissions inventory methodologies for various source categories.

The Project Site has a General Plan land use designation of C (Commercial). The C land use designation is defined as local and regional serving retail, personal service, entertainment, office, related commercial uses and limited residential uses with a CUP.[5] Therefore, the emissions associated with the Proposed Project have already been accounted for in the AQMP and approval of the Proposed Project would not conflict with the AQMP. No significant adverse impacts are identified or anticipated and no mitigation measures are required.

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[5] City of San Bernardino General Plan, Figure LU-2: General Plan Land Use Map, and Table LU-2: Land Use Designations. http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Pages: 2-13 and 2-19

b) **Less than Significant Impact.** The Proposed Project construction and operational emissions were screened using the California Emissions Estimator Model (CalEEMod) version 2020.4 prepared by the SCAQMD (see Appendix A for model output). Findings of the model run are discussed here in. CalEEMod was utilized to estimate the on-site and off-site emissions. The emissions incorporate the SCAQMD Rule 402 and Rule 403 by default as required during construction. The criteria pollutants screened for include reactive organic gases (ROG), nitrous oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), and particulates (PM_{10} and $PM_{2.5}$). Two of the analyzed pollutants, ROG and NO_x, are ozone precursors. Both summer and winter season emission levels were estimated.

Construction Emissions

Construction emissions are considered short-term, temporary emissions and were modeled with the following construction parameters: site preparation, site grading (fine and mass grading), building construction, paving, and architectural coating. The resulting emissions generated by construction of the Proposed Project are shown in Table 2 and Table 3, which represent summer and winter emissions, respectively.

Table 2
Summer Construction Emissions Summary
(Pounds Per Day)

Source/Phase	**ROG**	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Site Preparation	3.2	33.1	20.4	0.0	10.6	6.1
Grading	2.0	21.0	15.8	0.0	4.3	2.5
Building Construction	2.2	18.3	22.1	0.0	2.6	1.3
Paving	1.8	10.2	15.1	0.0	0.7	0.5
Architectural Coating	7.2	1.4	2.7	0.0	0.4	0.1
Highest Value (lbs/day)	**7.2**	**33.1**	**22.1**	**0.0**	**10.6**	**6.1**
SCAQMD Threshold	75	100	550	150	150	55
Significant	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod 2020.4 Summer Emissions
Phases do not overlap and represent the highest concentration.

Table 3
Winter Construction Emissions Summary
(Pounds Per Day)

Source/Phase	**ROG**	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Site Preparation	3.2	33.1	20.3	0.0	10.7	6.1
Grading	2.0	20.1	15.8	0.0	4.3	2.6
Building Construction	2.3	18.4	21.7	0.0	2.6	1.3
Paving	1.8	10.2	15.1	0.0	0.7	0.5
Architectural Coating	7.2	1.4	2.6	0.0	0.4	0.1
Highest Value (lbs/day)	**7.2**	**33.1**	**21.7**	**0.0**	**10.7**	**6.1**
SCAQMD Threshold	75	100	550	150	150	55
Significant	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod 2020.4 Winter Emissions
Phases do not overlap and represent the highest concentration.

As shown in Table 2 and Table 3, construction emissions during either summer or winter seasonal conditions would not exceed SCAQMD thresholds. Impacts would be less than significant, and no mitigation measures would be required.

Compliance with SCAQMD Rules 402 and 403

Although the Proposed Project does not exceed SCAQMD thresholds for construction emissions, the Project Proponent would be required to comply with all applicable SCAQMD rules and regulations as the SCAB is in non-attainment status for ozone and suspended particulates (PM_{10} and $PM_{2.5}$).

The Proposed Project would be required to comply with Rules 402 nuisance, and 403 fugitive dust, which require the implementation of Best Available Control Measures (BACMs) for each fugitive dust source, and the AQMP, which identifies Best Available Control Technologies (BACTs) for area sources and point sources. The BACMs and BACTs would include, but not be limited to the following:

Standard Conditions and Requirements:

1. The Project Proponent shall ensure that any portion of the site to be graded shall be pre-watered prior to the onset of grading activities.

    (a) The Project Proponent shall ensure that watering of the site or other soil stabilization method shall be employed on an on-going basis after the initiation of any grading activity on the site. Portions of the site that are actively being graded shall be watered regularly (twice daily) to ensure that a crust is formed on the ground surface and shall be watered at the end of each workday.

    (b) The Project Proponent shall ensure that all disturbed areas are treated to prevent erosion until the site is constructed upon.

    (c) The Project Proponent shall ensure that landscaped areas are installed as soon as possible to reduce the potential for wind erosion.

    (d) The Project Proponent shall ensure that all grading activities are suspended during first and second stage ozone episodes or when winds exceed 25 miles per hour.

During construction, exhaust emissions from construction vehicles and equipment and fugitive dust generated by equipment traveling over exposed surfaces, would increase NO_X and PM_{10} levels in the area. Although the Proposed Project does not exceed SCAQMD thresholds during construction, the Applicant/Contractor would be required to implement the following conditions as required by SCAQMD:

Standard Conditions and Requirements:

2. To reduce emissions, all equipment used in grading and construction must be tuned and maintained to the manufacturer’s specification to maximize efficient burning of vehicle fuel.

3. The Project Proponent shall ensure that existing power sources are utilized where feasible via temporary power poles to avoid on-site power generation during construction.

4. The Project Proponent shall ensure that construction personnel are informed of ride sharing and transit opportunities.

5. All buildings on the Project Site shall conform to energy use guidelines in Title 24 of the California Administrative Code.

6. The operator shall maintain and effectively utilize and schedule on-site equipment in order to minimize exhaust emissions from truck idling.

7. The operator shall comply with all existing and future CARB and SCAQMD regulations related to diesel-fueled trucks, which may include among others: (1) meeting more stringent emission standards; (2) retrofitting existing engines with particulate traps; (3) use of low sulfur fuel; and (4) use of alternative fuels or equipment.

Operational Emissions

The operational mobile source emissions were calculated using the Trip Generation Assessment prepared by Urban Crossroads on July 14, 2021. The City-approved assessment determined that the Project would generate 50 total daily trips, of which 38 vehicle trips would be produced by passenger cars, while 12 vehicle trips would be produced by a combination of 2-axle, 3-axle and 4-axle+ trucks. Emissions associated with the Project's estimated vehicle trips were modeled and are listed in Table 4 and Table 5, which represent summer and winter operational emissions, respectively.

Table 4
Summer Operational Emissions Summary
(Pounds Per Day)

Source	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Area	0.3	0.0	0.0	0.0	0.0	0.0
Energy	0.0	0.0	0.0	0.0	0.0	0.0
Mobile	0.1	0.3	0.5	0.0	0.0	0.0
Totals	**0.3**	**0.3**	**0.6**	**0.0**	**0.2**	**0.0**
SCAQMD Threshold	55	55	550	150	150	55
Significant	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod 2020.4 Summer Emissions

Table 5
Winter Operational Emissions Summary
(Pounds Per Day)

Source	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Area	0.3	0.0	0.0	0.0	0.0	0.0
Energy	0.0	0.1	0.0	0.0	0.0	0.0
Mobile	0.1	0.3	0.5	0.0	0.1	0.0
Totals	**0.3**	**0.3**	**0.5**	**0.0**	**0.2**	**0.0**
SCAQMD Threshold	55	55	550	150	150	55
Significant	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod 2020.4 Winter Emissions

As shown, both summer and winter season operational emissions are below SCAQMD thresholds. The Proposed Project would not exceed any SCAQMD thresholds for criteria pollutants during construction (see Tables 2 and 3). Operational emissions are less than significant and would not result in a cumulatively considerable net increase of any criteria pollutant (see Tables 4 and 5). Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

c) **Less than Significant Impact.** SCAQMD has developed a methodology to assess the localized impacts of emissions from a proposed project as outlined within the Final Localized Significance Threshold (LST) Methodology report; completed in June 2003 and revised in July 2008. The use of LSTs is voluntary to be implemented at the discretion of local public agencies acting as a lead agency pursuant to CEQA. LSTs apply to projects that must undergo CEQA or the National Environmental Policy Act (NEPA) and are five acres or less. LST methodology is incorporated to present worst-case scenario off-site construction emissions. The LSTs were developed to analyze the significance of potential air quality impacts of proposed projects to sensitive receptors and provide screening tables for small projects (one, two, or five acres). Projects are evaluated based on geographic location and distance from the sensitive receptor (25, 50, 100, 200, or 500 meters from the site).

For the purposes of a CEQA analysis, the SCAQMD considers a sensitive receptor to be a receptor such as a residence, hospital, convalescent facility or anywhere that is possible for an individual to remain for 24 hours. Additionally, schools, playgrounds, childcare centers, and athletic facilities can also be considered as sensitive receptors. Commercial and industrial facilities are not included in the definition of sensitive receptor because employees do not typically remain on-site for a full 24 hours, but are usually present for shorter periods of time, such as eight hours.

The Project Site is approximately 7 acres and therefore, the “five-acre” LST thresholds were utilized for a conservative analysis as larger projects typically receive a larger emissions allowance. The nearest sensitive receptor to the Project Site is a nonconforming single-family residence located approximately 875 feet (268 meters) northeast of the Project Site and therefore LSTs are based on a 200-meter distance. A comparison of the Proposed Project’s construction and operational emissions with the appropriate LST thresholds is presented in Table 6.

Table 6
Localized Significance Thresholds
(Pounds per Day)

Source	NO_x	CO	PM_{10}		$PM_{2.5}$	
Construction Emissions (Max. from Table 2 and Table 3)	33.1	27.1	10.7		6.1	
Operational Emissions (Max. Total from Table 4 and Table 5)[1]	0.3	0.6	0.2		0.0	
Highest Value (lbs/day)	**33.1**	**27.1**	**10.7**	**0.2**	**6.1**	**0.0**
LST Thresholds	486	8,532	106*	26†	35*	9†
Greater Than Threshold	**No**	**No**	**No**	**No**	**No**	**No**

Note: PM_{10} and $PM_{2.5}$ emissions are separated into construction and operational thresholds in accordance with the SCAQMD Mass Rate LST Look-up Tables.

* Construction emissions LST

† Operational emissions LST

[1] Per LST Methodology, mobile source emissions do not need to be included except for land use emissions and on-site vehicle emissions. It is estimated that approximately 10 percent of mobile emissions will occur on the Project Site.

Source: CalEEMod.2020.4 Summer & Winter Emissions; SCAQMD Final Localized Significance Threshold Methodology; SCAQMD Mass Rate Look-up Tables for five-acre site in Source Receptor Area No. 34, distance of 200 meters.

As shown in Table 6, the Proposed Project's emissions are not anticipated to exceed the thresholds for LSTs. Therefore, the Proposed Project is not anticipated to expose sensitive receptors to substantial pollutant concentrations. No significant adverse impacts are identified or anticipated and no mitigation measures are required.

d) **Less than Significant Impact.** The Proposed Project does not contain land uses typically associated with the emission of objectionable odors. Potential odor sources associated with the Proposed Project may result from construction equipment exhaust, the application of asphalt and architectural coatings during construction activities, and the temporary storage of domestic solid waste (refuse) associated with the Proposed Project's long-term operational uses. Standard construction requirements would minimize odor impacts resulting from construction activity. It should be noted that any construction odor emissions generated would be temporary, short-term, and intermittent in nature and would cease upon completion of the respective phase of construction activity. It is expected that Project-generated refuse would be stored in covered containers and removed at regular intervals in compliance with the City of San Bernardino's solid waste regulations. The Proposed Project would be also required to comply with SCAQMD Rule 402 to prevent occurrences of public nuisances. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	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 Game or US 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 Game or US Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (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?	☐	☐	☐	☒

Discussion:

a) **Less than Significant Impact with Mitigation.** A Habitat Assessment was prepared for the Proposed Project by ELMT Consulting completed dated August 20, 2021 (see Appendix B). The most recent records of the California Natural Diversity Database (CNDDB) managed by CDFW (CDFW 2020), the USFWS Critical Habitat Mapper (USFWS 2020) and the California Native Plant Society's Electronic Inventory (CNPSEI) of Rare and Endangered Vascular Plants of California (CNPS 2020) were reviewed. A general reconnaissance survey was conducted for the

Project Site to identify the potential for the occurrence of special status species, vegetation communities, or habitats that could support special status wildlife species.

The literature search identified twenty-five (25) special-status plant species, sixty-six (66) special-status wildlife species, and three (3) special-status plant communities as having potential to occur within the San Bernardino South USGS 7.5-minute quadrangle. Special-status plant and wildlife species were evaluated for their potential to occur within the project site based on habitat requirements, availability and quality of suitable habitat, and known distributions.

The habitat assessment was conducted on June 10, 2021 to document baseline conditions and assess the potential for special-status plant and wildlife species to occur within the project site that could pose a constraint to implementation of the proposed project.

Vegetation

The disturbed area onsite is composed primarily of non-native early successional/ruderal plant species. The disturbed areas onsite have been subject to routine anthropogenic disturbance associated with routine weed abatement and surrounding development. Plant species found within the disturbed areas on-site were dominated non-native grasses such as bromes (*Bromus* sp.) and oats (*Avena* sp.). Common plant species observed onsite include Russian thistle (*Salsola tragus*), lambs quarters (*Chenopodium album*), Mediterranean mustard (*Hirschfeldia incana*), prickly lettuce (*Lactuca serriola*), telegraph weed (*Heterotheca grandiflora*), red-stemmed filaree (*Erodium cicutarum*), California croton (*Croton californica*), ragweed (*Ambrosia psilostachya*), jimsonweed (*Datura wrightii*), deerweed (*Acmispon glaber*), California buckwheat (*Eriogonum fasciculatum*), spurge (*Euphorbia* sp.), Mexican fan palm (*Washingtonia robusta*), and puncturevine (*Tribulus terrestris*). In addition, the remnant swale supports a small stand of large shrubs and trees composed of cottonwood (*Populus fremontii*), salt cedar (*Tamarix* sp.), mulefat (*Baccharis salicifolia*), and oleander (*Nerium oleander*).

Wildlife

The Project Site provides limited habitat for wildlife species except those adapted to a high degree of anthropogenic disturbances and development. No fish or hydrogeomorphic features (e.g., perennial creeks, ponds, lakes, reservoirs) that would provide suitable habitat for fish were observed on or within the vicinity of the Project Site. The only reptilian species observed was Great Basin fence lizard (*Sceloporus occidentalis longipes*). Additional common reptilian species that could potentially occur on-site include western side-blotched lizard (*Uta stansburiana elegans*) and San Diego alligator lizard (*Elgaria multicarinata webbii*). Bird species detected during the field investigation include house finch (*Haemorhous mexicanus*), killdeer (*Charadrius vociferus*), common raven (*Corvus corax*), and cliff swallow (*Petrochelidon pyrrhonota*). Mammalian species detected during the field investigation include feral domestic cat (*Felis catus*). Common mammalian species that could be expected to occur include pocket gopher (*Thomomys bottae*), coyote (*Canis latrans*), possum (*Didelphis virginiana*), and raccoon (*Procyon lotor*).

No active nests or birds displaying nesting behavior were observed during the field survey, which was conducted during breeding season. Although subjected to routine disturbance, the ornamental vegetation found on-site has the potential to provide suitable nesting habitat for year-round and seasonal avian residents, as well as migrating songbirds that could occur in the area that area adapted to urban environments.

Based literature review and field survey, and existing site conditions, implementation of the Proposed Project would have no significant impacts on federally or State listed species known to occur in the general vicinity of the project site. Additionally, the Proposed Project would have no effect on designated Critical Habitat or regional wildlife corridors/linkage because none exists within the area. No jurisdictional drainage and/or wetland features were observed on the project site during the field investigation. No further surveys are recommended. However, the Proposed Project may have potential significant impacts on nesting birds. Therefore, implementation of Mitigation Measure BIO-1 is recommended.

Mitigation Measure BIO-1:

If construction occurs between February 1st and August 31st, a pre-construction clearance survey for nesting birds should be conducted within three (3) days of the start of any vegetation removal or ground disturbing activities to ensure that no nesting birds will be disturbed during construction. The biologist conducting the clearance survey should document a negative survey with a brief letter report indicating that no impacts to active avian nests will occur. If an active avian nest is discovered during the pre-construction clearance survey, construction activities should stay outside of a no-disturbance buffer. The size of the no-disturbance buffer will be determined by the wildlife biologist and will depend on the level of noise and/or surrounding anthropogenic disturbances, line of sight between the nest and the construction activity, type and duration of construction activity, ambient noise, species habituation, and topographical barriers. These factors will be evaluated on a case-by-case basis when developing buffer distances. Limits of construction to avoid an active nest will be established in the field with flagging, fencing, or other appropriate barriers; and construction personnel will be instructed on the sensitivity of nest areas. A biological monitor should be present to delineate the boundaries of the buffer area and to monitor the active nest to ensure that nesting behavior is not adversely affected by the construction activity. Once the young have fledged and left the nest, or the nest otherwise becomes inactive under natural conditions, construction activities within the buffer area can occur.

b) **Less than Significant Impact.** According to the habitat assessment, no hydrogeomorphic features (e.g., perennial creeks, ponds, lakes, reservoirs) that would provide suitable habitat for fish were observed on or within the vicinity of the Project Site. Therefore, no fish are expected to occur and are presumed absent from the project site. No 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 the US Fish and Wildlife Service. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

c) **No Impact.** The habitat assessment states that no riverine resources were identified on the project site. It should be noted that one (1) riverine resource was identified adjacent to the eastern boundary of the site, outside of the project footprint, associated with the channelized portion of Lytle Creek. No drainage features were observed on-site during the field investigations. Project activities are not expected to encroach into the Lytle Creek Channel; and therefore, development of the project will not result in impacts to US Army Corps of Engineers, Regional Water Quality Control Board, or CDFW jurisdiction and regulatory approvals will not be required. Wetlands were not observed on-site. Therefore, no impacts are identified or anticipated and no mitigation measures are required.

d) **Less than Significant Impact.** Habitat linkages provide connections between larger habitat areas that are separated by development. Wildlife corridors are similar to linkages but provide specific opportunities for animals to disperse or migrate between areas. A corridor can be defined as a linear landscape feature of sufficient width to allow animal movement between two comparatively undisturbed habitat fragments. Adequate cover is essential for a corridor to function as a wildlife movement area. It is possible for a habitat corridor to be adequate for one species yet still inadequate for others. Wildlife corridors are features that allow for the dispersal, seasonal migration, breeding, and foraging of a variety of wildlife species. Additionally, open space can provide a buffer against both human disturbance and natural fluctuations in resources. According to the San Bernardino County General Plan which covers areas near the City boundary, the project site has not been identified as occurring within a Wildlife Corridor or Linkage. however, major open space areas documented in the vicinity of the project site include the Santa Ana River, located approximately 1.5 miles to the southeast, and the Lytle Creek Wash, located approximately 2.3 miles to the northwest.

The proposed project will be confined to a location within existing areas that have been heavily disturbed and are isolated from regional wildlife corridors and linkages. In addition, there are no riparian corridors, creeks, or useful patches of steppingstone habitat (natural areas) within or connecting the site to a recognized wildlife corridor or linkage; the adjacent Lytle Creek Channel is improved with concrete bottom and sides. As such, implementation of the proposed project is not expected to impact wildlife movement opportunities. Therefore, impacts to wildlife corridors or linkages are not expected to occur. No significant adverse impacts are identified or anticipated and no mitigation measures are required.

e) **Less than Signifncant Impact.** As discussed in the General Plan, a variety of sensitive biological elements are known to exist or potentially occur within the City. Many of these sensitive elements are closely associated with the aquatic and woodland communities of the San Bernardino Mountains and the Santa Ana River and its tributaries. According to General Plan Figure NRC-1: “Potential Habitat for Sensitive Species,” the Project Site does not occur within an area identified as Critical Habitat. However, there are several trees located throughout the Project Site. As such, the Proposed Project shall adhere to the Section19.28.100 “Removal or Destruction of Trees” of the San Bernardino City Municipal Code to ensure less than significant impacts occur. The City’s Municipal Code Section 19.28.100 requires a tree removal permit for anyone who wants to remove five or more trees within a 36-month period. Section 19.28.100 mandates the replacement of removed trees on a 1:1 basis. An arborist survey and report could be requested to evaluate existing trees prior to the issuance of a tree removal permit. With adherence to the Municipal Code, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

f) **No Impact.** The Project Site does not occur within the planning area of an adopted Habitat Conservation Plan, Natural Community Plan, or other approved local, regional, or State habitat conservation plan as identified in the CDFW’s California Natural Community Conservation Plans Map (April 2019).[6] Therefore, no impacts are identified or anticipated and no mitigation measures are required.

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[6] California Department of Fish and Wildlife’s California Natural Community Conservation Plans Map, April 2019.

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	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 formal cemeteries?	☐	☒	☐	☐

Discussion:

a/b) **Less than Significant with Mitigation Incorporated.** A Cultural Resources Study dated June 25, 2021, was prepared for the Project Site by Brian F. Smith and Associates, Inc. Findings of the Cultural Resources Study are summarized herein and provided in Appendix C of this Initial Study. The cultural resources study consisted of an institutional records search, an intensive cultural resource survey of the entire 7.08-acre project, and the preparation of a technical report. The study was conducted in conformance with City of San Bernardino environmental guidelines, Section 21083.2 of the California Public Resources Code, and CEQA. Statutory requirements of CEQA (Section 15064.5) were followed for the identification and evaluation of resources. Specific definitions for archaeological resource type(s) used in this report are those established by the State Historic Preservation Office.

As identified on the 1959 aerial photograph, the subject property historically contained a structure in the southwestern corner. Further, as noted during the survey, the property appears to have been impacted by the neighboring improvements such as the I-215 alignment and channelization of the East Branch of Lytle Creek, which occurred prior to CEQA environmental regulations. As such, the status of the property appears to have affected the potential to discover any evidence of archaeological sites. If archaeological materials exist at the subject property but have been masked or buried by past earthwork, grading of the project will expose such buried resources. To ensure less than significant impacts occur, the Proposed Project Shall adhere to Mitigation Measures CR-1 through CR-3.

The survey methodology employed during the investigation followed standard archaeological field procedures and was sufficient to accomplish a thorough assessment of the project. The field methodology employed included walking evenly spaced survey transects set approximately 10 meters apart while visually inspecting the ground surface. All potentially sensitive areas where cultural resources might be located were closely inspected. Photographs documenting survey areas and overall survey conditions were taken frequently.

The Project Site appears to have been partially impacted by the previous developments that have taken place adjacent to the project. Evidence of earthwork, primarily situated along the northwestern and northeastern boundary, adjacent to the I-215 on-ramp alignment and channelized

East Branch of Lytle Creek, was noted. Further, within the southwestern portion of the project, it appears the parking lot for the larger adjacent buildings first identified on the 1980 aerial photograph has been extended into the current project parcels (Plate 3.2–3). The two radio towers were also identified on the property. However, despite first appearing on the 1967 map, it is obvious they have been maintained and replaced, are still in service, and comprised entirely of modern materials and therefore do not contain any historic elements (Plate 3.2–4). As such, they are not eligible for evaluation for inclusion in the CRHR and the survey did not identify any historic or prehistoric resources.

The cultural resources study concluded that the Project Site was negative for the presence of significant cultural resources. However, the property is located adjacent to a natural water source, Lytle Creek, which would have been an advantageous feature exploited by the prehistoric and historic inhabitants of the region. As such, the City of San Bernardino required that the consulting archaeologist for the project submit a Cultural Resources Pre-Grade Test Plan (CRTP) to stipulate the procedures to be followed to conduct a presence/absence testing prior to the initiation of grading of the property. The CRTP was requested by the San Manuel Band of Mission Indians (Tribe) as a means to determine if Native American monitoring was necessary given the disturbed status of the property.

The purpose the October 14, 2021 archaeological testing program was to implement the pre-grading subsurface testing at the project as outlined in the approved Cultural Resources Pre-Grade Test Plan. To gather sufficient information to formulate an assessment of the potential for Native American sites within the property, seven short backhoe trenches were excavated at pre-determined locations across the property. The screening process was monitored by representatives of the San Manuel Band of Mission Indians.

The excavation of the seven backhoe trenches resulted in the conclusion that no Native American archaeological deposits, artifacts, or features are located within this property. All of the seven trenches produced modern and historic glass fragments within the recovery. No prehistoric resources were identified. Results of the testing are included in Appendix C-1. Based upon the information from the field investigation, there did not appear to be any evidence of prehistoric Native American use of the Project Site. The soil observed during the trenching was typically light brown, loose to moderately compacted sandy material with evidence of alluvial cobbles. In conclusion, the trenches excavated within the project did not include the observation of any cultural deposits.

Mitigation Measure CR-1:

Monitor(s) Shall Be Present During Grading/Excavation/Trenching. The archaeological monitor shall be present full-time during all soil-disturbing and grading/excavation/trenching activities that could result in impacts to archaeological resources. The principal investigator (PI) may submit a detailed letter to the lead agency during construction requesting a modification to the monitoring program when a field condition such as modern disturbance post-dating previous grading/trenching activities, presence of fossil formations, or native soils is encountered that may reduce or increase the potential for resources to be present.

Mitigation Measure CR-2:

Discovery Notification Process. In the event of an archaeological discovery, either historic or prehistoric, the archaeological monitor shall direct the contractor to temporarily divert all

soil-disturbing activities, including but not limited to, digging, trenching, excavating, or grading activities in the area of discovery and in the area reasonably suspected to overlay adjacent resources, and immediately notify the Native American monitor and client, as appropriate. The monitor shall immediately notify the PI (unless monitor is the PI) of the discovery

Mitigation Measure CR-3:

Determination of Significance. The PI shall evaluate the significance of the resource. The PI shall immediately notify the City to discuss significance determination and shall also submit a letter indicating whether additional mitigation is required. If the resource is significant, the PI shall submit an Archaeological Data Recovery Program (ADRP) that has also been reviewed by the Native American consultant/monitor, and obtain written approval from the City to implement that program. Impacts to significant resources must be mitigated before ground disturbing activities in the area of discovery will be allowed to resume. If the resource is not significant, the PI shall submit a letter to the City indicating that artifacts will be collected, curated, and documented in the final monitoring report. The letter shall also indicate that no further work is required.

c) **Less than Significant with Mitigation Incorporated.** The discovery of human remains is always a possibility during ground-disturbing activities. Therefore, possible significant adverse impacts have been identified or anticipated and the following mitigation measure is required as a condition of project approval to reduce these impacts to a level of less than significant:

Mitigation Measure CR-4:

Discovery of Human Remains. If human remains are discovered, work shall halt in that area until a determination can be made regarding the provenance of the human remains, and the following procedures as set forth in CEQA Section 15064.5(e), the California Public Resources Code (Sec. 5097.98), and the State Health and Safety Code (Sec. 7050.5) shall be undertaken:

I. Notification 1. The archaeological monitor shall notify the PI, if the monitor is not qualified as a PI. 2. The PI shall notify the medical examiner after consultation with the City, either in person or via telephone.

II. Isolate discovery site

1. Work shall be directed away from the location of the discovery and any nearby area reasonably suspected to overlay adjacent human remains until a determination can be made by the medical examiner in consultation with the PI concerning the provenance of the remains.

2. The medical examiner, in consultation with the PI, will determine the need for a field examination to determine the provenance.

3. If a field examination is not warranted, the medical examiner will determine, with input from the PI, if the remains are or are most likely to be of Native American origin. III. If human remains ARE determined to be Native American 1. The medical examiner will notify the NAHC within 24 hours. By law, ONLY the medical examiner can make this call. 2. The

NAHC will immediately identify the person or persons determined to be the Most Likely Descendent (MLD) and provide contact information. 3. The MLD will contact the PI within 24 hours or sooner after the medical examiner has completed coordination to begin the consultation process in accordance with CEQA Section 15064.5(e), the California Public Resources, and the State Health and Safety Code.

4. The MLD will have 48 hours to make recommendations to the property owner or representative for the treatment or disposition with proper dignity of the human remains and associated grave goods.

5. Disposition of Native American human remains will be determined between the MLD and the PI, and, if: a) The NAHC is unable to identify the MLD, or the MLD failed to make a recommendation within 48 hours after being notified by the NAHC; or b) The landowner or authorized representative rejects the recommendation of the MLD and mediation in accordance with Public Resources Code 5097.94 (k) by the NAHC fails to provide measures acceptable to the landowner; then c) Upon the discovery of multiple Native American human remains during a ground-disturbing land development activity, the landowner may agree that additional conferral with descendants is necessary to consider culturally appropriate treatment of multiple Native American human remains. Culturally appropriate treatment of such a discovery may be ascertained from review of the site utilizing cultural and archaeological standards. Where the parties are unable to agree upon the appropriate treatment measures, the human remains and grave goods buried with the Native American human remains shall be reinterred with appropriate dignity.

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

Discussion:

a) **Less than Significant Impact.**

Electricity

The Proposed Project includes the construction and operation of a truck sales and service/repair, and parts sales dealership. Southern California Edison (SCE) would provide electricity for the Project. According to the California Energy Commission, the commercial building sector of the Southern California Edison planning area consumed 36,202.653241GWh of electricity in 2019.[7] The Project Site contains two radio broadcast towers which currently utilize an unknown amount of electricity. The implementation of the Proposed Project would result in an increase in electricity demand. According to the California Emissions Estimator Model (CalEEMod) prepared for the Proposed Project (see Appendix A for model output), the estimated electricity demand for the Proposed Project is 0.059 GWh per year. The Proposed Project's estimated annual electricity consumption compared to the 2019 annual electricity consumption of the overall commercial building sector in the SCE Planning Area would account for approximately 0.00016 percent of total electricity consumption. The increase in electricity demand from the Proposed Project is insignificant compared to the projected electricity demand for SCE's entire service area.

The Proposed Project has been designed to comply with the 2019 Building Energy Efficiency Standards. The City of San Bernardino would review and verify that the Proposed Project plans would be in compliance with the most current version of the Building and Energy Efficiency Standards. The Proposed Project would also be required adhere to CALGreen, which establishes planning and design standards for sustainable developments and energy efficiency. The Proposed Project would not result in a significant impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation. Therefore, less than significant impacts are identified or anticipated, and no mitigation measures are required.

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[7] https://ecdms.energy.ca.gov/Default.aspx. Accessed August 15, 2021.

Natural Gas

The Project Site would be serviced by Southern California Gas Company (SoCalGas). The Project Site contains two radio broadcast towers which are presumed to have minimal or no demand for natural gas. Therefore, the development of the Proposed Project will create a permanent increase demand for natural gas. According to the California Energy Commission, the natural gas consumption of the SoCalGas planning area commercial building sector was 974,982,675 therms in 2019.[8] According to the California Emissions Estimator Model (CalEEMod) prepared for the Proposed Project (see Appendix A for model output), the estimated annual natural gas demand is 1,923.6 therms. The Proposed Project's estimated annual natural gas consumption compared to the 2019 annual natural gas consumption of the overall commercial building sector in the SoCalGas Planning Area would account for approximately 0.00019 percent of total natural gas consumption.

b) **Less than Significant Impact.** The City of San Bernardino partners with other local jurisdictions under the County of San Bernardino Regional Greenhouse Gas Emissions Reduction Plan to ensure project designs and operations shall comply with the GHG Reduction Plan standards. Project development would not cause inefficient, wasteful and unnecessary energy consumption, and no adverse impact would occur.

The Proposed Project would be required to adhere to the County of San Bernardino Regional Greenhouse Gas Emissions Reduction Plan and Title 24 in order to help decrease energy consumption and GHG emissions, and to become a more sustainable community and to meet the goals of AB 32. The Proposed Project would not conflict with any applicable plan, policy or regulation of an agency adopted to reduce GHG emissions, including Title 24, AB 32, and SB 32. The Proposed Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency and therefore no significant adverse impacts are identified or are anticipated, and no mitigation measures are required.

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[8] https://ecdms.energy.ca.gov/Default.aspx. Accessed August 15, 2021.

VII. GEOLOGY AND SOILS – Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐
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?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18 1-B of the Uniform Building Code (1994), creating substantial 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?	☐	☒	☐	☐

Discussion:

a) A Geotechnical Investigation & Soils Infiltration Testing for WQMD-BMP Design (Soils Report) dated April 6, 2021 was prepared by Soils Southwest, Inc. Findings of the report are summarized herein and provided in Appendix D of this Initial Study.

i. **Less than Significant Impact.** According to the Soils Report, there are no known active faults that pass through or towards the Project Site, and the Site is not situated in an Alquist-Priolo Special Studies Zone. Human occupancy structures are prohibited within 50 feet of either side of an active fault. The San Jacinto fault zone occurs approximately one mile west of the Project Site and is the nearest fault system. To the north, approximately 6 (six) miles, of the Project Site is the San Andreas Fault.[9] Due to the distance of these faults, rupture on-site is not anticipated. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

ii. **Less than Significant with Mitigation.** As is the case for most areas of southern California, strong seismic ground shaking resulting from earthquakes associated with nearby faults may occur at the Project Site. Strong seismic ground shaking can be expected to induce lower horizontal accelerations due to smaller anticipated earthquakes during the lifetime of the proposed structures. Development of the Project Site would take place in accordance with the applicable requirements listed in the International Building Code (IBC), the California Building Standards Code, and the Buildings and Construction requirements of the City of San Bernardino Municipal Code.

Similarly, the Soils Report provided recommendations to ensure appropriate site preparation. Therefore, to reduce potential impacts to less than significant level, the following mitigation measure shall be implemented:

Mitigation Measure GEO-1:

Prior to the issuance of grading permits, the Applicant shall submit to and receive approval from the City a Final Geotechnical Report with recommendations for appropriate site preparation to prevent any substantial adverse effects from on-site geotechnical conditions. The City Engineer shall inspect the work to ensure compliance.

With implementation of Mitigation Measure GEO-1, impacts can be reduced to a less than significant level.

iii. **Less than Significant Impact.** Liquefaction is a phenomenon in which cohesion-less, saturated, fine-grained sand and silt soils loose shear strength due to ground shaking. As a result, the soil behaves like a liquid, has an inability to support weight, and can flow down gentle slopes. This condition is usually temporary and is most often caused by an earthquake vibrating water-saturated fill or unconsolidated soil. As identified in Figure S-5: “Liquefaction Susceptibility” of the San Bernardino General Plan, the Project Site is located in an area identified as having a High (H) liquefaction susceptibility.[10] San Bernardino is surrounded by earthquake faults; the two largest known faults include the San Andreas and San Jacinto Faults. Additionally, the potential for fault rupture, strong ground shaking, and liquefaction is high throughout the City. Seismic related ground failure that affects structures is minimized to the extent feasible through compliance with the IBC and the California Building Standards Code. Recommendations as provided in the Final Geotechnical Report shall be incorporated as required in Mitigation Measure GEO-1. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

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[9] Southern California Earthquake Data Center. https://scedc.caltech.edu/earthquake/significant.html Accessed October 20, 2021.

[10] City of San Bernardino General Plan Figure S-5: “Liquefaction Susceptibility” http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Page 10-25

iv. **Less than Significant Impact.** According to the Soils Report, the Project Site is near level with developed surroundings and does not have characteristics (i.e., slopes) that would result in landslides. In addition, according to the Figure S-7, "Slope Stability and Major Landslides" of the City General Plan, the Project Site is located outside of a landslide potential hazard area.[11] Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

b) **Less than Significant Impact.** During the development of the Project Site that would include disturbance of approximately 7.0 acres, project-related dust may be generated due to the operation of machinery on-site or due to high winds. Additionally, erosion of soils could occur due to a storm event. Development of the Proposed Project would disturb more than one acre of soil; therefore, the Proposed Project is subject to the requirements of the State Water Resources Control Board General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit Order 2009-2009-DWQ). Construction activity subject to this permit include clearing, grading, and disturbances to the ground such as stockpiling or excavation. The Construction General Permit requires the development and implementation of a Storm Water Pollution and Prevention Plan (SWPPP). The SWPPP must list Best Management Practices (BMPs) to avoid and minimize soil erosion. Adherence to BMPs is anticipated to ensure that the Proposed Project does not result in substantial soil erosion or the loss of topsoil. The WQMP will be subject to City approval prior to the issuance of a grading permit. No significant adverse impacts are identified or are anticipated, and no mitigation measures are required.

c) **Less than Significant Impact.** According to the Figure S-7: "Slope Stability and Major Landslides" of the City General Plan, the Project Site is located outside of a landslide potential hazard area. The Project Site is relatively flat with no prominent geologic features occurring on or within the vicinity of the Project Site. Additionally, during a recent site visit conducted in September 2021, no nearby hillsides that could result in a landslide, were observed. Therefore, the Project Site is not located within an area with potential for landslides. As identified in Figure S-6: "Potential Subsidence Areas" of the San Bernardino General Plan, the Project Site occurs in an area of potential ground subsidence which can be caused by natural geologic processes or by human activity such as subsurface mining or pumping of groundwater or oil.[12] Seismic-related ground failure that may affect structures would be minimized to the extent feasible through compliance with the IBC and the California Building Standards Code. Recommendations as provided in the Final Geotechnical Report shall be incorporated as required in Mitigation Measure GEO-1. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

d) **Less than Significant Impact.** Expansive soils (shrink-swell) are fine grained clay soils generally found in historical floodplains and lakes. Expansive soils are subject to swelling and shrinkage in relation to the amount of moisture present in the soil. Structures built on expansive soils may incur damage due to differential settlement of the soil as expansion and contraction takes place.

According to the Soils Report, the earth materials encountered during the exploratory excavations were documented at 45 feet deep showed sand light grayish brown, medium, pebbles scattered rock fragments. The samples were also described as gravely, traces of sand, fine to medium course,

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[11] City of San Bernardino General Plan Figure S-7: Slope Stability and Major Landslides http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Page 10-33

[12] City of San Bernardino General Plan Figure S-6: Potential Subsidence Areas http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Page 10-31

pebbles rock fragments and loose. These materials are considered sandy and gravely and silty in nature and are considered “very low” in expansion characteristics.

Although, the proposed buildings would be developed in accordance with the applicable building standards and the Uniform Building Code, recommendations from the Final Geotechnical Report as approved by the City shall be incorporated as required in Mitigation Measure GEO-1. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

e) **No Impact.** The Proposed Project is expected to connect to the City’s sewer collection system, which currently provides service to the surrounding vicinity and would not require the use of septic tanks or alternative wastewater disposal systems; therefore, no impacts are identified or anticipated and no mitigation measured are required.

f) **Less than Significant with Mitigation**. Although the Cultural Resources Study conducted by Brian F. Smith and Associates, Inc. did not identify the Project Site as paleontologically sensitive, the San Bernardino General Plan identifies paleontological resources as an important asset. The discovery of paleontological resource on site or a unique geologic feature is a possibility during ground-disturbing activities. Therefore, to ensure less than significant adverse impacts occur, the following mitigation measure is required as a condition of project approval:

Mitigation Measure GEO-2:

Paleontological Resources. Any deep excavations (usually over 5 feet in depth) in the proposed Project area must be monitored by a qualified paleontologist. In the event of an inadvertent discovery, the following measures shall apply:

1. **If fossils are found during earthwork activities, all earthmoving actives within a 100-feet shall stop, the City and a qualified vertebrate paleontologist must be contacted. The vertebrate paleontologist shall examine the remains and determine the next appropriate action based on his or her findings. All monitoring shall conform to the standards and protocols of the San Bernardino County Museum and approved by the Lead Agency.**
2. **If the fossil discovery is deemed significant, and upon recommendation of the paleontologist and approval by the City, the fossils shall be quickly and professionally recovered using appropriate recovery techniques based on the type, size, and mode of preservation of the unearthed fossils.**
3. **Earthwork may resume in the area of the fossil discovery once the fossil has been recovered, and the qualified paleontologist deems the site has been mitigated to the extent necessary. Additional earthwork following the fossil discovery may continue to be monitored for paleontological resources on an as-needed basis, at the discretion of the qualified paleontologist.**
4. **Recovered fossils shall be prepared, identified, cataloged, and stored in a recognized professional repository along with associated field notes, photographs, and compiled fossil locality data. For projects in San Bernardino County the recommended designated repository is the San Bernardino County Museum.**
5. **A final summary report shall be completed that outlines the results of the mitigation program. This report shall include discussions of the methods used, stratigraphic section(s) exposed, fossils collected, and significance of recovered fossils. This report shall be submitted to the City of San Bernardino, and designated repository.**

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	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?	☐	☐	☒	☐

Discussion:

a) **Less than Significant Impact.** Emissions were estimated using the CalEEMod version 2020.4. Parameters used to estimate construction emissions, such as the worker and vendor trips and trip lengths, utilized the CalEEMod defaults (see Appendix A). The Trip Generation Assessment which anticipates 50 total daily trips, of which 38 vehicle trips would be produced by passenger cars, while 12 vehicle trips would be produced by a combination of 2-axle, 3-axle, and 4-axle+ trucks was used in the modeling.

Many gases make up the group of pollutants that contribute to global climate change. However, three gases are currently evaluated and represent the highest concertation of GHG: Carbon dioxide (CO_2), Methane (CH_4), and Nitrous oxide (N_2O). SCAQMD provides guidance methods and/or Emission Factors that are used for evaluating a project’s emissions in relation to the thresholds. A threshold of 3,000 $MTCO_2E$ per year has been adopted by SCAQMD for commercial uses. The modeled emissions anticipated from the Proposed Project compared to the SCAQMD threshold are shown below in Table 7 and Table 8.

Table 7
Greenhouse Gas Construction Emissions
(Metric Tons per Year)

Source/Phase	CO_2	CH_4	N_20
Site Preparation	17.5	0.0	0.0
Grading	27.4	0.0	0.0
Building Construction	463.4	0.0	0.0
Paving	21.3	0.0	0.0
Architectural Coating	4.8	0.0	0.0
Total MTCO2e	**515.6**		
SCAQMD Threshold	3,000		
Significant	**No**		

Source: CalEEMod.2020.4 Annual Emissions.

Table 8
Greenhouse Gas Operational Emissions
(Metric Tons per Year)

Source/Phase	**CO_2**	**CH_4**	**N_20**
Area	0.0	0.0	0.0
Energy	24.5	0.0	0.0
Mobile	30.9	0.0	0.0
Waste	4.6	0.0	0.0
Water	2.9	0.0	0.0
Total MTCO2e	**62.8**		
SCAQMD Threshold	3,000		
Significant	**No**		

Source: CalEEMod.2020.4 Annual Emissions.

As shown in Table 7 and Table 8, the Proposed Project's emissions would not exceed the SCAQMD's 3,000 $MTCO_2e$ threshold of significance. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

b) **Less than Significant Impact.** There are no existing GHG plans, policies, or regulations that have been adopted by CARB or SCAQMD that would apply to this type of emissions source. However, the operator would be required to comply with CARB and SCAQMD regulations related to diesel-fueled trucks, which may include among others: (1) meeting more stringent emission standards; (2) retrofitting existing engines with particulate traps; (3) use of low sulfur fuel; and (4) use of alternative fuels or equipment.

It is possible that CARB may develop performance standards for project-related activities prior to construction of the Proposed Project. In this event, these performance standards would be implemented and adhered to, and there would be no conflict with any applicable plan, policy, or regulations. The Proposed Project is consistent with CARB scoping measures and therefore does not conflict with local or regional greenhouse gas plans. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

IX. **HAZARDS AND HAZARDOUS MATERIALS** – Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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 Section 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 for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

a, b) **Less than Significant Impact with Mitigation Incorporated.** The Proposed Project would not require the routine transport or use of hazardous materials. The general use proposed at the site (i.e., a truck sales and service/repair, and parts sales dealership) would not in and of itself create a significant hazard to the public or the environment due to the use of hazardous materials. The service/repair operations would be minor repairs and service to prepare new vehicles for sales off the lot. There would be no engine or other mechanic work. No significant quantities of hazardous materials would be stored or used on-site. Post-construction activities would also include standard property maintenance (i.e., landscape upkeep, parking lot striping and similar activities) involving the use of commercially available products (e.g., pesticides, herbicides, gas, oil, paint, etc.) the use of which would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accidental release of hazardous materials into the environment.

Hazardous or toxic materials transported in association with construction of the Project may include items such as oils, paints, and fuels. Therefore, possible significant adverse impacts have been identified or anticipated and the following mitigation measures are required as a condition of project approval to reduce these impacts to a level of less than significant:

Mitigation Measure HAZ-1:

Prior to construction, the Project Proponent shall prepare and submit to the City a Hazardous Spill Prevention Plan to minimize the likelihood of a spill. The plan shall state the actions that would be required if a spill occurs to prevent contamination of surface waters and provide for cleanup of the spill. The plan shall follow federal, State, and local safety guidelines and standards to avoid increased exposure to these pollutants.

c) **No Impact.** The nearest school to the Project Site is Richardson Prep Middle School, located approximately 0.27 miles west of the Project Site. The Proposed Project would not require the routine transport or use of hazardous materials. No schools exist within a quarter-mile of the Project Site. Therefore, no impacts are identified or anticipated, and no mitigation measures are required.

d) **No Impact.** The Project Site is not included on a list of hazardous material sites as compiled pursuant to Government Code Section 65962.5 and reported in the Department of Toxic Substances Control EnviroStor database (accessed 10/20/2021).[13] In the event that hazardous materials are identified on the Project Site during construction, standard reporting and remediation regulations would apply. Therefore, no impacts are identified or anticipated, and no mitigation measures are required.

e) **No Impact.** According to the City's General Plan Figure LU-4: "San Bernardino International Airport Planning Boundaries", the Project Site occurs outside the San Bernardino International Airport (SBIA) Influence Area.[14] The SBIA is located approximately 3.05 miles east of the Project Site. Therefore, implementation of the Proposed Project would not result in a safety hazard related to airport land uses for people residing or working in the area. No impacts are identified or anticipated, and no mitigation measures are required.

f) **No Impact.** The City's General Plan does not identify the Project Site or adjacent uses as emergency facilities and or as emergency evacuation routes. However, the PP-2 Evacuation Map of the San Bernardino Countywide Plan shows that the I-215 serves as an evacuation route for the

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[13] California Department of Toxic Substances Control EnviroStor Database. https://www.envirostor.dtsc.ca.gov/public/. Accessed October, 20 2021.

[14] City of San Bernardino General Plan, Figure LU-4: San Bernardino International Airport Planning Boundaries. http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Page 2-47

region.[15] During construction, the contractor would be required to maintain adequate emergency access for emergency vehicles as required by the City of San Bernardino. Project operations would not interfere with an adopted emergency response or evacuation plans. The driveway at Mill Street would be maintained for ingress/egress at all times. As shown on Figure 3: Site Plan, a 26’ foot emergency access is proposed along the southeast portion of the Project Site. Therefore, no impacts are identified or anticipated, and no mitigation measures are required.

g) **No Impact.** As shown on Figure S-9: “Fire Hazard Areas” [16] in the City’s General Plan, the Project Site does not occur in a fire hazard area. The Project Site and surrounding area are urbanized and located over 3.75 miles south of the nearest wildlands fire hazard designated area. Therefore, no impacts are identified or anticipated and no mitigation measures are required.

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[15] San Bernardino Countywide Plan: PP-2 Evacuation Routes. https://www.arcgis.com/apps/webappviewer/index.html?id=f54aff8f279449b8a6591ed4a8b1198c Accessed November 3, 2021

[16] City of San Bernardino General Plan, Figure S-9: Fire Hazard Areas. http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Page 10-43

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	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?	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede substantial 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 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 off-site;	☐	☐	☒	☐
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 substantial groundwater management plan?	☐	☐	☐	☒

Discussion:

a) **Less than Significant with Mitigation Incorporated.** The Proposed Project would disturb an approximate 7.08-acre site and therefore would be subject to the NPDES permit requirements. The State of California is authorized to administer various aspects of the NPDES. Construction activities covered under the State's General Construction permit include removal of vegetation, grading, excavating, or any other activities that causes the disturbance of 1 acre or more. The

General Construction permit requires recipients to reduce or eliminate non-storm water discharges into stormwater systems, and to develop and implement an SWPPP. The SWPPP must include Best Management Practices (BMPs) to prevent project-related pollutants from impacting surface waters during construction and include but are not limited to street sweeping of paved roads around the Project Site during construction, and the use of hay bales or sandbags to control erosion during the rainy season. BMPs may also include or require:

- The contractor to avoid applying materials during periods of rainfall and protect freshly applied materials from runoff until dry.

- All waste to be disposed of in accordance with local, state and federal regulations. The contractor to contract with a local waste hauler or ensure that waste containers are emptied weekly. Waste containers cannot be washed out on-site.

- All equipment and vehicles to be serviced off-site.

The NPDES also requires a Water Quality Management Plan (WQMP) which would be subject to review and approval by the City. A WQMP dated October 2021 has been prepared by Joseph E Bonadiman & Associates, Inc. for the Project Site (see Appendix D) and submitted to the City for review and approval. Findings of the report are discussed herein in c) below. The WQMP includes mandatory compliance of BMPs as well as compliance with NPDES Permit requirements. Review and approval of the WQMP by the City of San Bernardino would ensure that all potential pollutants of concern are minimized or otherwise appropriately treated prior to being discharged from the Project Site. To ensure potential impacts are reduced to less than significant, the following mitigation measure shall be implemented:

Mitigation Measure WQ-1:

The Project Proponent shall implement all Non-Structural Source Control Best Management Practices (BMPs) and Structural Source BMPs as listed in the final WQMP as approved by the City.

b) **No Impact.** The Project Site is located within the service area of the San Bernardino Valley Municipal Water District (SBVWCD), a wholesale water supplier. The SBVWCD's boundaries encompass more than 78 square miles and include portions of the communities of San Bernardino, Loma Linda, Redlands, Highland and Colton, as well as the unincorporated county area of Mentone and other unincorporated county "islands" within the incorporated cities.[17] It spans the eastern two thirds of the San Bernardino Valley, the Crafton Hills, and a portion of the Yucaipa Valley and includes the cities and communities of San Bernardino, Colton, Loma Linda, Redlands, Rialto, Fontana, Bloomington, Highland, East Highland, Grand Terrace, Mentone, and Yucaipa. Valley District imports water into its service area through participation in the State Water Project (SWP) and manages groundwater storage within its boundaries, its enabling act includes a broad range of powers to provide water, wastewater and stormwater disposal, recreation, and fire protection services In addition to potable water, SBMWD provides wastewater collection and treatment services and is developing a recycled water system for groundwater recharge and non-potable reuse.

Water service is provided by the City of San Bernardino Municipal Water Department (SBMWD). The SBMWD relies on local groundwater and imported water as its primary sources of water

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[17] 2020 Integrated Regional Urban Water Management Plan; Part 1 Regional Context

supply. The Proposed Project is an acceptable use within the Commercial land use category and therefore would be accounted for in the long-range water supply projections planned for by the City of San Bernardino's General Plan and the 2020 SBMWD Urban Water Management Plan. The Proposed Project does not include groundwater wells that would impact the production rate of any nearby pre-existing wells. The Proposed Project also includes a water detention/water quality basin that will allow for continued groundwater recharge of any storm water. No significant adverse impacts are identified or are anticipated, and no mitigation measures are required.

c) i) **Less than Significant Impact.** As stated in Section VII(b), during development of the Project Site, erosion of soils could occur due to a storm event. Development of the Proposed Project would disturb more than one acre of soil; therefore, the Proposed Project is subject to the requirements of the State Water Resources Control Board General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit Order 2009-2009-DWQ). Construction activity subject to this permit includes clearing, grading, and disturbances to the ground such as stockpiling or excavation. The Construction General Permit requires the development and implementation of a SWPPP. The SWPPP must list BMPs to avoid and minimize soil erosion. Adherence to BMPs is anticipated to ensure that the Proposed Project does not result in substantial erosion or siltation on- or off-site. Therefore, no significant adverse impacts are identified or anticipated, and no mitigation measures are required.

ii, iii) **Less than Significant Impact.** As described in the Water Quality Management Plan, post-development flows will be conveyed to an underground storm infiltration chamber at the northern corner of the Project Site, with the capacity of 2.07 acre-feet (90,169 cubic feet) resulting in a peak discharge of 3.71 cubic feet/second from the 100-year, 24-hour storm. The design will reduce the developed conditions peak flow rate to the maximum allowable peak flows. Flows from a 100-year storm event will be captured within the proposed basin; any flows from larger storm events would flow to Mill Street to maintain the existing drainage pattern. The Project Site is not in the vicinity of any groundwater recharge facilities and the Proposed Project does not include groundwater wells that would impact the production rate of any nearby existing wells. The Proposed Project is not expected to substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. The San Bernardino County Flood Control (Lytle Creek Channel) east of the Project Site would not be impacted as all proposed improvements would occur within the boundaries of the Project Site and groundwater recharge would continue in the channel. With adherence to the WQMP, the Proposed Project is not anticipated to substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site, or 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. No significant adverse impacts are identified or are anticipated, and no mitigation measures are required.

iv) **Less than Significant Impact.** According to the Preliminary Hydrology Study and Drainage Analysis dated October 2021 prepared by Joseph E Bonadiman & Associates, Inc. (see Appendix E) pre-development conditions, drainage generally flows to the southeast where current flow are directed to the existing industrial complex and conveyed around the perimeter of the complex via existing gutters. Due to the fact that site is in a low area, connection to the storm channel is not allowed without permit from the USACE, and the fact that there is not sufficient elevation to accommodate an on-site detention basin the only option to mitigate storm water flow is an underground infiltration retention/detention system. This system will be designed to capture storm flows from the 100-year event and provide enough capacity in order to reduce the total site discharge to 90% of the predeveloped condition. any flows from larger storm events would flow to Mill Street to maintain the existing drainage pattern. Therefore, no increase in flows would result within implementation of the Proposed Project. No significant adverse impacts are identified or are anticipated, and no mitigation measures are required.

d) **No Impact**. The Project Site is located outside of the 100-year and 500-year flood Zone as identified in Figure S-1: “100-Year Flood Plain” of the San Bernardino General Plan[18]. Therefore, implementation of the Proposed Project is not anticipated to impede or redirect flood flows within the 100-year flood zone. Furthermore, due to inland distance from the Pacific Ocean and any other significant body of water, tsunamis and seiches are not potential hazards at the site. The Project Site and vicinity is within relatively flat terrain and there are no nearby hillsides that would result in mudflows. Therefore, no impacts from seiche and tsunami are identified or anticipated, and no mitigation measures are required.

e) **No Impact.** The Proposed Project would not create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. All necessary drainage improvements will be required as conditions of approval for the construction of the Proposed Project so that downstream properties are not negatively impacted by any increases or changes in volume, velocity, or direction of storm water flows originating from or altered by the Project Site. According to the WQMP, the implementation of the bioretention basin will capture 90% on-site water flows; therefore, no impacts are identified or anticipated, and no mitigation measures are required.

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[18] City of San Bernardino General Plan, Figure S-1: “100- Year Flood Plain” http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Page 10-13

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	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?	☐	☐	☐	☒

Discussion:

a) **No Impact.** According to Figure LU-2: "General Plan Land Use Map", the Project Site is within the Commercial (C) land use designation defined as local and regional serving retail, personal service, entertainment, office, related commercial uses and limited residential uses with a CUP.[19] The Project Site is within the CCS-1(Central City South-1) zone area as shown on City of San Bernardino Public Zoning Map (accessed 10/20/2021). Intended uses within this zoning designation include local and regional serving retail and service uses in locations where they will be compatible with and not adversely impact adjacent land uses. The surrounding land uses include: Lytle Creek Flood Control Channel to the north and east, Mill Street and commercial uses to the south, and Interstate 215 to the west. Implementation of the Proposed Project would not divide an established community. Therefore, no impacts are identified or anticipated, and no mitigation measures are required.

b) **No Impact.** The Proposed Project will be consistent with the provisions of the City of San Bernardino General Plan and Municipal Code and would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project area for the purposes of avoiding or mitigating an environmental effect. Therefore, no impacts are identified or anticipated, and no mitigation measures are required.

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[19] City of San Bernardino General Plan, Figure LU-2: General Plan Land Use Map, and Table LU-2: Land Use Designations. http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Pages: 2-13 and 2-19

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	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 of 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?	☐	☐	☒	☐

Discussion:

a-b) **Less than Significant Impact.** According to Figure NRC-3: "Mineral Resource Zones" of the City's General Plan, the Project Site is located within the MRZ-2 boundary.[20] MRZ-2 zone includes areas where the available geologic information indicates that there are significant mineral deposits or that there is a likelihood of significant mineral deposits. In the San Bernardino City area, the bulk of the construction aggregate is found in the natural sand and gravel deposits of Cajon Wash, Lytle Creek, Warm Creek, City Creek, and the Santa Ana River. The Project Site is currently designated Commercial. The proposed use for the Project Site is consistent with the City's General Plan, and under the existing land use designation, would not be permitted for mining. Based on the surrounding land uses, the Project Site's land use designation, and the size of the Project site, a mining operation would not be feasible or permitted. The region supports readily available supplies of mineral resources used in the building industry. The Proposed Project would not result in the loss of availability of a known mineral resource that would be of value to the region. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

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[20] City of San Bernardino General Plan, Figure NRC-3: Mineral Resource Zones. http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Page: 12-15.

XIII. NOISE – Would the project result in:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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 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?	☐	☐	☒	☐

Discussion:

a) **Less than Significant Impact.** Noise can be measured in the form of a decibel (dB), which is a unit for describing the amplitude of sound. The predominant rating scales for noise in the State of California are the Equivalent-Continuous Sound Level (L_{eq}), and the Community Noise Equivalent Level (CNEL), which are both based on the A-weighted decibel (dBA). The L_{eq} is defined as the total sound energy of time-varying noise over a sample period. The CNEL is defined as time-varying noise over a 24-hour period with a weighted factor of 5 dBA applied to the hourly L_{eq} for noise occurring form 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and 10 dBA applied to events occurring between (10:00 p.m. and 7:00 a.m. defined as sleeping hours). The State of California's Office of Noise Control has established standards and guidelines for acceptable community noise levels based on the CNEL and L_{dn} rating scales. The purpose of these standards and guidelines is to provide a framework for setting local standards for human exposure to noise.

San Bernardino is affected by several different sources of noise, including automobile, rail and air traffic, sports events, commercial and industrial activity, and periodic nuisances such as construction. Excessive levels of noise can damage human physical health, psychological stability, social cohesion, property values, and economic productivity. The control of noise, therefore, is an essential component in creating a safe, compatible, and productive environment.

Based on data from similar dealership/repair operations, the exterior noise conditions at the Project Site with the Proposed Project are expected to be less than significant as passenger vehicle trips anticipated to be 38 trips and 12 truck trips. Furthermore, the Project Site is adjacent to the Interstate 215 Freeway which generates noise to the Project Site and surrounding area. A noise level of 65 dBA L_{dn} or less is an acceptable zone where all projects could be approved. Exceeding 65 dBA L_{dn} is a normally unacceptable zone where mitigation measures would be required and evaluation for approval or denial of the project. The Proposed Project is not anticipated to exceed noise levels of 65 dBA $L_{dn.}$ Construction activities would be short-term and would occur within the daytime hours permitted by Chapter 8.54 of the Municipal Code.[21] Permitted construction hours in the City are identified in Subsection 8.54.050 of the Municipal Code and are between the hours of 8:00 a.m. and 8:00 p.m. in residential zones and between the hours of 7:00 a.m. and 8:00 p.m. in all other zones. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

b) **Less than Significant Impact.** Construction of the Proposed Project is not anticipated to require the use of equipment that would generate excessive groundborne vibration or groundborne noise levels. It is likely that minor vibration would result from construction and grading activities. Construction equipment may result in vibration levels that are considered annoying at nearby sensitive receptors when vibration causing equipment is within 100 feet of a receptor. However, per the City's Municipal Code, construction hours are limited, and the Proposed Project's construction would be short-term. Furthermore, the nearest sensitive receptor is a nonconforming single-family residence 875 feet northwest of the Project Site. Adhering to the Municipal Code would ensure impacts from construction would be less than significant. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

c) **Less than Significant Impact.** The San Bernardino International Airport (SBIA) is approximately 3.05 miles east of the Project Site and the site is outside the SBIA Influence Area. The Proposed Project includes a truck sales and service/repair, and parts sales dealership to include 5,950 square-foot (sf) office building, 168 12-foot by 55-foot trailer truck stalls, 21 12-foot by 30-foot truck stalls and seven passenger car parking spaces. The use would be compatible with surrounding development. The nearest sensitive receptor is a nonconforming single-family residence 900 feet northwest of the Project Site. The Proposed Project would not exceed the "normally acceptable" noise level as shown in Figure N-1: "Land Use Compatibility for Community Noise Exposure" of the City's General Plan[22] and noise levels would not be considered excessive. Additionally, the proposed use would be consistent with the City's CCS-1(Central City South-1) zoning designation. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

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[21] City of San Bernardino Municipal Code, Chapter 8.54: Noise Control. http://www.ci.san-bernardino.ca.us/civicax/filebank/blobdload.aspx?blobid=19233. Page 615

[22] City of San Bernardino General Plan, Figure N-1: Land Use Compatibility for Community Noise Exposure http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Page 14-5

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
XIV. POPULATION AND HOUSING – Would the project:				
a) Induce substantial 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)?	☐	☐	☒	☐
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion:

a) **Less than Significant Impact.** Construction activities at the Project Site would be short-term and would not attract new employees to the area since there is an existing pool of construction labor in the region. The Proposed Project includes truck sales and service/repair, and parts sales dealership to include 5,950 square-foot (sf) office building, 168 12-foot by 55-foot trailer truck stalls, 21 12-foot by 30-foot truck stalls and seven passenger car parking spaces. There would be approximately five employees required for operation of the Proposed Project. The Proposed Project is consistent with the City of San Bernardino’s General Plan and Development Code and the Project’s local employment is anticipated in the City of San Bernardino’s General Plan. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

b) **No Impact.** The Project Site does not currently have residential units on-site. No housing would be displaced as a result of the proposed Project. Therefore, no impacts are identified or anticipated and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
XV. PUBLIC SERVICES				
a) Would the project 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?	☐	☐	☒	☐

Discussion:

a) Fire Protection:

Less than Significant Impact. According to the General Plan, fire prevention, fire protection, and emergency medical service in the planning area within the San Bernardino City limits are provided by the San Bernardino County Fire Department.[23] The nearest fire station to the Project Site is Fire Station 221, located at 200 3rd Street, San Bernardino, approximately 1.25 miles northeast of the Project Site. There are twelve fire stations in San Bernardino and the Department has mutual joint response agreements with the cities of Loma Linda, Colton, Rialto; Central Valley Fire District (Station #75, in Muscoy); and the U.S. Forest Service. The Proposed Project is not anticipated to impact response times or put unnecessary strain on existing fire services as Proposed Project does not include residences or any high fire risk uses, or is located in a high fire hazard area. As shown on Figure 3: Site Plan, a 26-foot-wide emergency/fire access is proposed along the southeast portion of the Project Site. The Site Plan would be reviewed by the County Fire Marshal prior to the issuance of development permits. Developer impact fees are collected at the time of building permit issuance to provide funding for necessary service increases associated with growth and development. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

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[23] City of San Bernardino General Plan http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Page 7-6

Police Protection:

Less than Significant Impact. Police services are provided by the City of San Bernardino Police Department (SBPD) within the City limits and the County Sheriff in the unincorporated area. The planning area is served by a main police station and six community service offices that serve five designated geographical patrol districts.[24] All emergency calls and requests for service from the Project Site would be dispatched from the main police station at 710 North D Street, which is located approximately 1.5 miles northeast from the Project Site. The Proposed Project is not expected to generate a significant increase in the need for police protection in the project area. The City Police Department would review the Site Plan prior to the issuance of development permits. Developer impact fees are collected at the time of building permit issuance to offset project impacts. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

Schools:

Less than Significant Impact. The Proposed Project is within San Bernardino City Unified School District (SBCUSD). Construction and operation of new school facilities would be funded through school impact fees assessed on new developments that occur within the school district. The Proposed Project is not anticipated to increase population growth within the area; there would be approximately five employees required for operation of the Proposed Project. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

Parks:

Less than Significant Impact. The City of San Bernardino has a total of 539.98 acres dedicated to parks and recreation, which include 52 developed parks & facilities.[25] There are nineteen neighborhood, ten community, seventeen mini, three regional parks and three special facilities. Additionally, many school sites, community centers and senior centers throughout the City are available for recreational activities. The City utilizes a park acreage standard of five acres per 1,000 residents. However, the Proposed Project is not anticipated to induce residential development and therefore would not significantly increase the use of existing neighborhood and regional parks or other recreational facilities. Collection of developer impact fees would ensure a less than significant impact. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

Other Public Facilities:

Less Than Significant Impact. The Proposed Project is not expected to have a significant impact on public facilities/services, such as libraries, community recreation centers, and/or animal shelters as there would be approximately five employees required for operation of the Proposed Project. Therefore, implementation of the Proposed Project would not adversely affect other public facilities or require the construction of new or modified facilities. Therefore, no significant adverse impacts are identified or anticipated, and no mitigation measures are required.

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[24] City of San Bernardino General Plan http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Page 7-4

[25] City of San Bernardino General Plan http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Page 8-5

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	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?	☐	☐	☐	☒

Discussion:

a) **Less than Significant Impact.** The City of San Bernardino has a total of 539.98 acres dedicated to parks and recreation, which include 52 developed parks & facilities.[26] There are nineteen neighborhood, ten community, seventeen mini, three regional parks and three special facilities. Additionally, many school sites, community centers and senior centers throughout the City are available for recreational activities. The City utilizes a park acreage standard of five acres per 1,000 residents. Therefore, no significant increase in the use of existing neighborhood and regional parks or other recreational facilities would result. Collection of developer impact fees would ensure a less than significant impact. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

b) **No Impact.** The Proposed Project does not include recreational facilities or require the construction or expansion of recreational facilities. Therefore, no impacts are identified or anticipated, and no mitigation measures are required.

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[26] City of San Bernardino General Plan http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Page 8-5

XVII. TRANSPORTATION/TRAFFIC – Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadways, bicycle lanes and pedestrian facilities?	☐	☐	☒	☐
b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3 Subdivision (b)(1)?	☐	☐	☒	☐
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?	☐	☐	☒	☐

Discussion:

a, b) **Less than Significant Impact.** A Traffic Scoping Agreement dated July 14, 2021 was approved by the City of San Bernardino Traffic Engineer concluding that no Traffic Impact Analysis was required (see Appendix F). The Proposed Project was screened to determine the need for a Vehicles Miles Traveled Analysis; results are dated June 28, 2021 and were prepared by Urban Crossroads (see Appendix G). The screening analysis provides a projection of traffic trips resulting from the Proposed Project and is summarized herein.

The Proposed Project would consist of a truck sales and service/repair, and parts sales dealership to include 5,950 square-foot (sf) office building, 168 12-foot by 55-foot trailer truck stalls, 21 12-foot by 30-foot truck stalls and seven passenger car parking spaces on an approximate 7-acre site. The Project is anticipated to be constructed in one phase by the year 2022. Access to the Project Site will be provided by a single driveway for ingress and egress on Mill Street.

The Proposed Project is forecast to generate a total of approximately 62 Passenger Car Equivalent (PCE) daily trips of Passenger Cars and Trailer Trucks. The Proposed Project anticipated to generate a total of 38 PCE, 4 2-axle (Light Heavy Duty), 4 3-axle (Medium Heavy Duty), and 4 4-axle (Heavy Heavy Duty) trips.

Circulation System

According to Figure C-2: Circulation Plan of the General Plan, Mill Street is identified as a Major Arterial roadway. [27]Major Arterial roadways can accommodate six or eight travel lanes and may have raised medians. These facilities carry high traffic volumes and are the primary thoroughfares linking San Bernardino with adjacent cities and the regional highway system. Driveway access to

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[27] City of San Bernardino General Plan http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199 Page 6-21

these roadways is typically limited to provide efficient high volume traffic flow. The project design is subject to City approval.

Bicycle lane

Figure PRT-2: Conceptual Trail System of the General Plan, shows that Mill Street includes a bicycle route along the Project Site.[28] The City has numerous existing and planned bicycle routes within the community, both on and off-street. The project design is subject to City approval. With City approval, the Proposed Project would not negatively impact bicycle lanes along Mill Street.

Transit

OmniTrans provides public transit to the City and surrounding area. According OmniTrans System Map, Line 15 runs on the southern side of Mill Street and the Project Site is located north of Mill Street therefore would not impact transit route.[29]

Pedestrian facilities

Pedestrian access and recreation is provided through the City's sidewalks and hiking trails. The existing sidewalk and driveway occur at Project Site along Mill Street. Development of the Proposed project is not anticipated to negatively impact pedestrian facilities.

The City of San Bernardino utilizes the San Bernardino County Transportation Authority (SBCTA) VMT Screening Tool (Screening Tool). The Screening Tool allows users to input an assessor's parcel number (APN) to determine if a project's location meets one or more of the screening thresholds for land use projects as identified in San Bernardino County Transportation Authority (SBCTA). Recommended Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment (SBCTA Guidelines) that addresses both traditional automobile delay-based level of service (LOS) and new VMT analysis requirements. (2) The City of San Bernardino then used the SBCTA Guidelines to develop its City of San Bernardino Traffic Impact Analysis Guidelines (August 2020) (City Guidelines). (3) These guidelines have been used to conduct this screening analysis.

The City Guidelines provides details on appropriate screening thresholds that can be used to identify when a proposed land use project is anticipated to result in a less than significant impact without conducting a more detailed project level analysis. Screening thresholds are broken into the following three steps:

- Transit Priority Area (TPA) Screening
- Low VMT Area Screening
- Project Type Screening

A land use project need only to meet one of the above screening thresholds to result in a less-than-significant impact.

TPA Screening

As described in the City Guidelines, projects located within a Transit Priority Area (TPA) (i.e., within ½ mile of an existing "major transit stop" or an existing stop along a "high-quality

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[28] City of San Bernardino General Plan http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199 Page 8-14

[29] OmniTrans: System Map https://www.google.com/maps/d/u/1/viewer?mid=1CmimZ3xcB-kT4dV6NGC5w96P66N7nXwB&ll=34.092119899894385%2C-117.30015872231564&z=18 Accessed October 29, 2021.

transit corridor" may be presumed to have a less than significant impact absent substantial evidence to the contrary. According to Urban Crossroads the Screening Tool, the Project site is not located within ½ mile of an existing major transit stop, or along a high-quality transit corridor. The TPA screening threshold is not met.

Low VMT Area Screening

The City Guidelines states that "residential and office projects located within a low VMT-generating area may be presumed to have a less than significant impact absent substantial evidence to the contrary. In addition, other employment-related and mixed-use land use projects may qualify for the use of screening if the project can reasonably be expected to generate VMT per resident, per worker or per service population that is similar to the existing land uses in the low VMT area." The parcel containing the proposed Project was selected and the Screening Tool was run for the Origin/Destination VMT per service population measure of VMT. Based on the Screening Tool results (see Appendix G), the Project is not located within a low VMT generating zone. The Low VMT Area screening threshold is not met.

Project Type Screening

The City Guidelines identifies that local serving retail projects less than 50,000 square feet may be presumed to have a less than significant impact absent substantial evidence to the contrary. In addition to local serving retail, other types of local serving uses such as community institutions (public libraries, fire stations, local government, etc.) may also be presumed to have a less than significant impact as their uses are local serving in nature and would tend to shorten vehicle trips. Additionally, the City Guidelines identify that small projects anticipated to generate low traffic volumes (i.e., fewer than 110 daily trips) are presumed to have a less than significant impact absent substantial evidence to the contrary. Due to the unique nature of the proposed Project, the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition, 2017) (3) does not appear to be the best source for calculating the Project's trip generation. As such, trip generation estimates for the proposed Project have been developed using traffic count data collected at the Applicant's existing 14400 Randall Avenue, Fontana CA over two consecutive days on June 8th and June 9th, 2021. The Proposed Project is intended to support the operations already occurring at 14400 Randall Avenue site, so it was chosen for survey to provide a close approximation of anticipated future activity. The Proposed Project is anticipated to generate 50 vehicle trip-ends per day, below the 110 daily vehicle trips. The Project Type screening threshold is met.

Based on Urban Crossroads review of applicable VMT screening thresholds, the Project meets the Project Type screening and would therefore be assumed to result in a less than significant VMT impact. Additionally, the trip generation assessment Proposed for the Project demonstrates the Projects impact to off-site study area intersections would be less than significant. The Proposed Project would not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadways, bicycle lanes and pedestrian facilities and would be consist with CEQA Guidelines Section 15064.3 Subdivision (b)(1). Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

c,d) **Less than Significant Impact.**

The Proposed Project would not create substantial hazards due to a design feature or incompatible uses. Access to the Project Site would be provided by a 40-foot-wide driveway at Mill Street. As shown on Figure 3: Site Plan, a 26-foot-wide emergency access is proposed along the southeast portion of the Project Site. Throughout construction, emergency access would be maintained at the Project Site. In the event of unforeseen and planned road closures during construction, appropriate

City departments would be notified, including at a minimum the police and fire departments. Adequate time to establish road detours would be provided to allow emergency vehicles to use alternate routes for emergency response. As with all new development, the Proposed Project would be required to comply with San Bernardino County Fire Department requirements and would be subject to the review by the Fire Marshal for emergency access. Discretionary actions for the Proposed Project by the City of San Bernardino includes review and approval of Project Design and Site Plan. As proposed, the Project would not substantially increase hazards due to a design feature or incompatible uses and would not result in inadequate emergency access. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

XVIII. TRIBAL CULTURAL RESOURCES:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code 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, 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 (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?	☐	☒	☐	☐

Discussion:

a)
i, ii) **Less than Significant with Mitigation Incorporated.** California Assembly Bill 52 (AB52) was approved by Governor Brown on September 25, 2014. AB52 specifies that CEQA projects with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource may have a significant effect on the environment. As such, the bill requires lead agency consultation with California Native American tribes traditionally and culturally affiliated with the geographic area of a proposed project, if the tribe requested to the lead agency, in writing, to be informed of proposed projects in that geographic area. The legislation further requires that the tribe-requested consultation be completed prior to determining whether a negative declaration, mitigated negative declaration, or environmental impact report is required for a project.

On June 29, 2021, following determination of a complete Project Application, the City of San Bernardino contacted representatives of the following tribes: Gabrieleño Band of Mission Indians - Kizh Nation, San Manuel Band of Mission Indians, and Soboba Band of Luiseño Indians. The City of San Bernardino received one response from the San Manuel Band of Mission Indians.

A Cultural Resources Study dated June 25, 2021, was prepared for the Project Site by Brian F. Smith and Associates, Inc. The City of San Bernardino required that the consulting archaeologist for the project submit a Cultural Resources Pre-Grade Test Plan (CRTP) to stipulate the procedures to be followed to conduct a presence/absence test prior to the initiation of grading of the property. The CRTP was requested by the San Manuel Band of Mission Indians (Tribe) as a means to determine if Native American monitoring was necessary given the disturbed status of the property.

The purpose the October 14, 2021 archaeological test investigation (included as Appendix C-1) was to implement the pre-grading subsurface testing at the project as outlined in the approved Cultural Resources Pre-Grade Test Plan. To gather sufficient information to formulate an assessment of the potential for Native American sites within the property, seven short backhoe trenches were excavated at pre-determined locations across the property. The screening process was monitored by representatives of the San Manuel Band of Mission Indians.

It was concluded that that no Native American archaeological deposits, artifacts, or features are located within this property. All of the seven trenches produced modern and historic glass fragments within the recovery. No prehistoric resources were identified. Although no tribal resources/objects with cultural value to a California Native American tribe were found, earthmoving activities associated with grading may uncovered tribal cultural resources with adherence Mitigation Measures CR-1 through CR-4 identified in section V of this Initial Study would ensure less than significant impacts occur.

XIX. UTILITIES AND SERVICE SYSTEMS – Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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, 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?	☐	☐	☒	☐
c) Result in a determination by the wastewater 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?	☐	☐	☒	☐

Discussion:

a) **Less than Significant Impact.** The Proposed Project would be served by the City of San Bernardino sewer collection and treatment system, which has wastewater treated by the City of San Bernardino Municipal Water Department (SBMWD). The SBMWD is responsible for two treatment plants that provide secondary and tertiary treatment levels. The San Bernardino Water Reclamation Plant (SBWRP) provides secondary treatment of wastewater collected from the cities of San Bernardino, Loma Linda, and Highland, and the San Bernardino International Airport.[30] The existing flow to the SBWRP of 28 MGD is less than the existing design capacity of 33 MGD. Buildout of the plant's service area could be expected to increase cumulatively by another 20.2 MGD for an eventual total flow of 48.2 MGD. Treated discharge from the SBWRP is then piped downstream to the Rapid Infiltration/Extraction Plant (RI/X) where flows are treated to tertiary levels and discharged to the Santa Ana River. An estimated 10 MGD of capacity remains available at the RI/X plant. The Proposed Project includes employee restroom and breakroom

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[30] City of San Bernardino Municipal Water Department. https://www.sbmwd.org/176/Water-Reclamation. Accessed July 30, 2020

facilities that would generate an increase in sewer flows. Based on an estimated water use factor of 15 gallons/day/employee, the Proposed Project would generate 75 gallons of wastewater daily. This represents 0.0015 percent of remaining available capacity at the SBWRP and therefore the Proposed Project would not impact the existing SBMWD's capacity.

The nearest sewer connection point is on Mill Street, south of and adjacent to the Project Site. The Proposed Project would not require or result in the construction of any new sewer collection or wastewater treatment facilities or expansion of existing facilities.

Development of the Proposed Project would result in new impervious surfaces on-site. However, the Proposed Project include an underground retention basin with a retention volume of 90,169 cubic-feet (CF), located within the northern portion of the Project Site. As such, direct infiltration of storm water from impervious surfaces would be captured and would provide for groundwater recharge.

The Project Site is serviced by Southern California Edison (SCE), which provides the electrical service to the project area. The Proposed Project will receive electrical power by connecting to SCE's existing power lines along Mill Street, adjacent to the Project Site. According to the California Energy Commission, the commercial building sector of the Southern California Edison planning area consumed 36,202.653241GWh of electricity in 2019.[31] The implementation of the Proposed Project would result in an increase in electricity demand. According to the California Emissions Estimator Model (CalEEMod) prepared for the Proposed Project (see Appendix A for model output), the estimated electricity demand for the Proposed Project is 0.059 GWh per year. The Proposed Project's estimated annual electricity consumption compared to the 2019 annual electricity consumption of the overall commercial building sector in the SCE Planning Area would account for approximately 0.00016 percent of total electricity consumption. The increase in electricity demand from the Proposed Project is insignificant compared to the projected electricity demand for SCE's entire service area.

SoCalGas provides natural gas service to City of San Bernardino and the surrounding communities. The Proposed Project will receive natural gas from the Southern California Gas Company by connecting to the existing line in Mill Street, adjacent to the Project Site. According to the California Energy Commission, the natural gas consumption of the SoCalGas planning area commercial building sector was 974,982,675 therms in 2019. According to the California Emissions Estimator Model (CalEEMod) prepared for the Proposed Project (see Appendix A for model output), the estimated annual natural gas demand is 1,923.6 therms. The Proposed Project's estimated annual natural gas consumption compared to the 2019 annual natural gas consumption of the overall commercial building sector in the SoCalGas Planning Area would account for approximately 0.00019 percent of total natural gas consumption. The existing SoCalGas facilities are expected to sufficiently serve the increased demand of natural gas. The commercial demand of natural gas is anticipated to decrease from approximately 81 billion cubic feet (bcf) to 65 bcf between the years 2015 to 2035. Therefore, the natural gas demand from the Proposed Project would represent an insignificant percentage to the overall demand in SoCalGas' service area. The Proposed Project would not require the expansion or construction of new natural gas facilities.

The Proposed Project will be served by Charter, Frontier and Time Warner for telecommunication services. The Project Site shall be serviced through existing Southern California Edison and SoCal

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[31] https://ecdms.energy.ca.gov/Default.aspx. Accessed August 15, 2021.

Gas facilities, which are expected to meet the needs of the Proposed Project. Therefore, no significant adverse impacts are identified or anticipated, and no mitigation measures are required.

b) **Less than Significant Impact.** The Project Site is located within the service area of the San Bernardino Valley Municipal Water District (SBVMWD), a water wholesaler. The SBVMWD's boundaries encompass more than 78 square miles and include portions of the communities of San Bernardino, Loma Linda, Redlands, Highland and Colton, as well as the unincorporated county area of Mentone and other unincorporated county "islands" within the incorporated cities.[32] It spans the eastern two thirds of the San Bernardino Valley, the Crafton Hills, and a portion of the Yucaipa Valley and includes the cities and communities of San Bernardino, Colton, Loma Linda, Redlands, Rialto, Fontana, Bloomington, Highland, East Highland, Grand Terrace, Mentone, and Yucaipa. SBVMWD imports water into its service area through participation in the State Water Project (SWP) and manages groundwater storage within its boundaries, its enabling act includes a broad range of powers to provide water, wastewater and stormwater disposal, recreation, and fire protection services. In addition to potable water, SBVMWD provides wastewater collection and treatment services and is developing a recycled water system for groundwater recharge and non-potable reuse.

Shown below in Table 9 is a comparison of regional water supplies and demands for the entire SBVMWD service area (including the City of San Bernardino) as provided in the 2020 Integrated Regional Urban Water Management Plan. The multiple-dry year period is generally the lowest annual runoff for a three-year or more consecutive period.

Table 9
Water Supply and Demand During Multiple-Dry Year Period Comparison (AF)

Year	Totals	2025	2030	2035	2040	2045
First Year	Supply Totals	5,344	54,974	56,504	57,734	58,963
	Demand Totals	46,473	47,803	49,134	50,203	51,272
	Difference (Supply minus Demand)	6,971	7,171	7,370	7,530	7,691
Second Year	Supply Totals	53,444	54,974	56,504	57,734	58,963
	Demand Totals	46,473	47,803	49,134	50,203	51,272
	Difference (Supply minus Demand)	6,971	7,171	7,370	7,530	7,691
Third Year	Supply Totals	53,444	54,974	56,504	57,734	58,963
	Demand Totals	46,473	47,803	49,134	50,203	51,272
	Difference (Supply minus Demand)	6,971	7,171	7,370	7,530	7,691

The table shows adequate regional supplies for the years 2025 to 2045 under multiple-dry year conditions.

The Proposed Project is an acceptable use within the Commercial land use category and therefore would result in the requirement of water supply that is already anticipated by the City of San Bernardino's General Plan and the 2020 Integrated Regional Urban Water Management Plan. The Proposed Project does not include groundwater wells that would impact the production rate of any nearby pre-existing wells. The Proposed Project also includes a water detention/water quality basin

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[32] 2020 Integrated Regional Urban Water Management Plan; Part 1 Regional Context

that will allow for continued groundwater recharge. No significant adverse impacts are identified or are anticipated, and no mitigation measures are required.

c) **Less than Significant Impact.** The Proposed Project would be served by the City of San Bernardino sewer collection and treatment system, which has wastewater treated by the City of San Bernardino Municipal Water Department (SBMWD). The SBMWD is responsible for two treatment plants that provide secondary and tertiary treatment levels. The San Bernardino Water Reclamation Plant (SBWRP) provides secondary treatment of wastewater collected from the cities of San Bernardino, Loma Linda, and Highland, and the San Bernardino International Airport.[33] The existing flow to the SBWRP of 28 MGD is far less than the existing design capacity of 33 MGD. Buildout of the plant's service area could be expected to increase cumulatively by another 20.2 MGD for a total flow of 48.2 MGD. Treated discharge from the SBWRP is then piped downstream to the Rapid Infiltration/Extraction Plant (RI/X) where flows are treated to tertiary levels and discharged to the Santa Ana River. An estimated 10 MGD of capacity remains at the RI/X plant. The Proposed Project does not include any facilities that would generate an increase in sewer flows over the existing use and therefore it would not impact the existing SBMWD's capacity. Therefore, no significant adverse impacts are identified or anticipated, and no mitigation measures are required.

d) **Less than Significant Impact.** Solid waste from the City of San Bernardino is transported to and disposed of at either the Colton or Mid-Valley Sanitary Landfill. Construction debris would be recycled and/or transported to the Mid-Valley Sanitary Landfill. The temporary generation of construction debris would not permanently affect the long-term landfill capacity. The Proposed Project will generate minimal domestic waste during operations. The Proposed Project is an acceptable use within the Commercial land use category and would not result a significant impact to an existing landfill capacity that was not anticipated by the General Plan. The Proposed Project is anticipated to be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs. Therefore, no significant adverse impacts are identified or are anticipated, and no mitigation measures are required.

e) **Less than Significant Impact.** During construction, the Proposed Project would comply with the City of San Bernardino waste reduction programs, including recycling and other diversion programs to divert the amount of solid waste disposed of in landfills. Materials that are not recycled in compliance with the Intergraded Waste Management Act (AB 939) are taken to one of two regional landfills in the valley (San Timoteo: permitted until 2026 or Mid-Valley: permitted until 2033). Post-construction activities at the Project Site are not anticipated to result in a significant amount of solid waste generation. The Proposed Project would comply with all applicable solid waste statutes and regulations. Additionally, the Project will provide a trash enclosure, per City Standards, on the west portion of the site. Therefore, no significant adverse impacts are identified or are anticipated, and no mitigation measures are required.

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[33] City of San Bernardino Municipal Water Department. https://www.sbmwd.org/176/Water-Reclamation. Accessed July 30, 2020

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
XX. WILDLFIRE – If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) 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 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 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?	☐	☐	☐	☒

Discussion:

a) **No Impact.** The Project Site does not contain any emergency facilities, nor does it serve as an emergency evacuation route. During construction and long-term operation, the contractor would be required to maintain adequate emergency access for emergency vehicles as required by the City. As shown on Figure 3: Site Plan, a 26-foot-wide emergency access is proposed along the southeast portion of the Project Site. The Proposed Project would not impair an adopted emergency response plan or emergency evacuation plan; therefore, no impacts are identified or are anticipated, and no mitigation measures are required.

b) **No Impact.** The Project Site is flat and vacant. The Project Site is located within a predominantly developed region with no wildlands are located on or adjacent to the Project Site. Typically, wildland fire hazards are of concern where development is adjacent to wildland areas. As shown in Figure S-9 "Fire Hazards Areas" of the City of San Bernardino General Plan, the Project Site is not identified in an area of risk for fire hazard.[34] Therefore, the Proposed Project is not anticipated to exacerbate wildfire risks, thereby exposing project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. Therefore, no impacts are identified or are anticipated, and no mitigation measures are required.

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[34] City of San Bernardino General Plan, Figure S-9 "Fire Hazards Areas" http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Page 10-43

c) **Less than Significant Impact.** The Project Site is located east of I-215 and north of Mill Street. The Proposed Project will not require additional connections to utilities or service system infrastructure. Therefore, the Proposed Project is not anticipated to require the installation or maintenance of associated infrastructure that may exacerbate fire risk or that may result in temporary ongoing impacts to the environment. No significant adverse impacts are identified or are anticipated, and no mitigation measures are required.

d) **No Impact.** According to the Feasibility Reports of Soils and Foundations, the site topography is near level with surrounding developed properties, and the potential for seismically induced land sliding is considered "remote." The Project Site is not located within an area susceptible to landslides as shown Figure S-7: "Slope Stability and Major Landslide" of the City of San Bernardino's General Plan.[35] The Project Site and immediate vicinity are relatively flat with no prominent geologic features. Additionally, as shown in Figure S-9 "Fire Hazards Areas" of the City of San Bernardino General Plan, the Project Site is not identified in an area associated with risk of fire hazard.

Additionally, the Project Site is outside of the 500-year floodplain as identified in Figure S-1 "100-year Flood Plain" of the City of San Bernardino's General Plan. The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (Map Number 06071C8686H) (accessed 10/29/2021) identifies the Project Site within Zone X, which is defined as areas of 0.2 percent annual chance flood; areas of one percent annual chance flood with average depths of less than one-foot or with drainage areas less than one square-mile; and areas protected by levees from one percent annual chance flood. Implementation of the Proposed Project is not anticipated to impede or redirect flood flows within the 100-year flood zone. [36] As stated in Section X(c) of this Initial Study, the Proposed Project is not anticipated to substantially alter the existing drainage pattern of the site or area, substantially increase the rate or amount of surface runoff, or impede or redirect potential flood flows. Therefore, the Proposed Project would not 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. No impacts are identified or anticipated, and no mitigation measures are required.

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[35] City of San Bernardino General Plan, Figure S-7: Slope Stability and Major Landslide http://www.sbcity.org/civicax/filebank/blobdload.aspx?blobid=26199. Page 10-33

[36] Federal Emergency Management Agency Flood Map Service Center: Search By Address https://msc.fema.gov/portal/search?AddressQuery=san%20bernardino. Accessed October 29, 2021

XIX. MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Does the project have the potential to 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, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of 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?	☐	☒	☐	☐

Discussion:

a) **Less than Significant Impact.** A Habitat Assessment was prepared for the Proposed Project by ELMT Consulting completed dated August 20, 2021. The Proposed Project may have potential significant impacts on nesting birds. No 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 Game or US Fish and Wildlife Service are anticipated. However, as discussed in this Initial Study, potential habitat exists for nesting birds. Implementation of Mitigation Measure BIO-1 would ensure potential impacts are reduced to a less than significant level.

A Cultural Resources Study dated June 25, 2021, was prepared for the Project Site by Brian F. Smith and Associates, Inc. Subsequently, a Cultural Resources Pre-Grade Test Plan (CRTP) was submitted and approved to conduct a presence/absence testing program to the initiation of grading of the property. The CRTP was requested by the San Manuel Band of Mission Indians (Tribe) as a means to determine if Native American monitoring was necessary given the disturbed status of the property. It was concluded that no Native American archaeological deposits, artifacts, or features are located within the Project Site. All of the seven trenches produced modern and historic glass fragments within the recovery. No prehistoric resources were identified. Although no tribal resources/objects with cultural value to a California Native American tribe were found, earthmoving activities associated with grading may uncovered tribal cultural resources.

Implementation of Mitigation Measures CR-1–CR-4 would ensure potential impacts to these resources are reduced to a less than significant level. Therefore, no significant adverse impacts are identified or anticipated and no additional mitigation measures are required.

b) **Less than Significant Impact.** Cumulative impacts are defined as two or more individual affects that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the development when added to the impacts of other closely related past, present, and reasonably foreseeable or probable future developments. Cumulative impacts can result from individually minor, but collectively significant, developments taking place over a period. The CEQA Guidelines, Section 15130 (a) and (b), states:

> (a) Cumulative impacts shall be discussed when the project's incremental effect is cumulatively considerable.
>
> (b) The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided of the effects attributable to the project. The discussion should be guided by the standards of practicality and reasonableness.

The pollutant emissions from the Proposed Project are below SCAQMD thresholds and therefore, the Proposed Project would be in compliance SCAQMD's AQMP. In addition, greenhouse gas emissions from the Proposed Project are below thresholds. Therefore, air quality and greenhouse gas impacts would not be cumulatively considerable. A Trip Generation Assessment and Vehicles Miles Traveled Screening Analysis were prepared by Urban Crossroads. The Proposed Project is forecast to generate a total of approximately 62 Passenger Car Equivalent (PCE) daily trips of Passenger Cars and Trailer Trucks. The Proposed Project anticipated to generate a total of 38 PCE, 4 2 axle (Light Heavy Duty), 4 3-axle (Medium Heavy Duty), and 4 4-axle (Heavy Heavy Duty) trips. Based on Urban Crossroads review of applicable VMT screening thresholds, the Project meets the Project Type screening and would therefore be assumed to result in a less than significant VMT impact. The trip generation assessment Proposed for the Project demonstrates the Projects impact to off-site study area intersections would be less than significant. The Proposed Project would not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadways, bicycle lanes and pedestrian facilities and would be consist with CEQA Guidelines Section 15064.3 Subdivision (b)(1). Therefore, no significant adverse impacts are identified or are anticipated, and no mitigation measures are required.

c) **Less than Significant Impact With Mitigation Incorporated.** The development of the Project as proposed would not cause adverse impacts on humans, either directly or indirectly. The Project Site is not located in an area that is susceptible to geologic hazards. No significant impacts from project-related construction or operational noise were identified. Implementation of Mitigation Measure HAZ-1 would ensure that potential impacts from any unanticipated spills would be reduced to a less than significant level. Therefore, implementation of the Proposed Project would not have environmental effects that would cause substantial adverse effects on human beings. At a minimum, the Project will be required to meet the conditions of approval for the Project to be implemented. The Mitigation Monitoring and Reporting Program (MMRP) to be adopted is included as Appendix H. It is anticipated that all such conditions of approval will further ensure that no potential for adverse impacts will be introduced by demolition/construction activities, and current or future land uses authorized by the Project approval. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

REFERENCES

The following references cited in the Initial Study are on file in the Development Services Department.

1. California Department of Conservation, California Important Farmland Finder. Accessed on August 2021 from http://maps.conservation.ca.gov/ciff/ciff.html.
2. California Department of Conservation, Division of Mines and Geology. 1995. “Mineral Land Classification of part of Southwestern San Bernardino County: The San Bernardino Valley, California.”
3. California Department of Toxic Substances Control. EnviroStor Database. Accessed on October 2021 from http://www.envirostor.dtsc.ca.gov/public/
4. California Energy Commission Efficiency Division. Title 24: 2019 Building Energy Efficiency Standards. Accessed October 2021 from https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency
5. City of San Bernardino General Plan. 2005.
6. City of San Bernardino Municipal Code. 2020
7. City of San Bernardino Municipal Water Department. https://www.sbmwd.org/176/Water-Reclamation.
8. County of San Bernardino: NR-5 Agricultural Resources https://www.arcgis.com/apps/webappviewer/index.html?id=fcb9bc427d2a4c5a981f97547a0e3688. Accessed October 2021.
9. Brian F Smith and Associates Inc, Cultural Resources Study For The 776 West Mill Street Project, June 25, 2021
10. Brian F Smith and Associates Inc, Archaeological Test Results, October 18, 2021
11. ELMT, Habitat Assessment for the Proposed Truck Sales, Service/Repair and Parts Dealership, August 20, 2021.
12. Federal Emergency Management Agency Flood Map Service Center: Search By Address https://msc.fema.gov/portal/search?AddressQuery=san%20bernardino. Accessed October,29 2020
13. Joseph E. Bonadiman & Associates, Inc., Hydrology Study & Drainage Analysis, October 2021.
14. Joseph E. Bonadiman & Associates, Inc., Preliminary Water Quality Management Plan, October 2021.
15. San Bernardino Valley Regional Urban Water Management Plan, 2015. Water Systems Consulting, Inc., June 2017.
16. Soils Southwest, Inc., Feasibility Study Reports of Soils and Foundations Evaluations & Soils Infiltration Testing for WQMP-BMP Design, April 2021.
17. Urban Crossroads, Inc., 776 W. Mill Street Vehicle Miles Traveled Screening Analysis, June 28, 2021.
18. Urban Crossroads, Inc., 776 W. Mill Street Vehicle Miles Trip Generation Assessment, July 14, 2021.

PREPARERS

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Attachment A
Notice of Intent (NOI)

NOTICE OF INTENT
TO ADOPT A MITIGATED NEGATIVE DECLARATION FOR THE TEC EQUIPMENT 776 W MILL STREET PROJECT

TO:	Responsible and Interested Parties – Distribution List	FROM:	City of San Bernardino Planning Division 290 North D Street San Bernardino, CA 92401	**December 21, 2021**

In accordance with the California Environmental Quality Act (CEQA) and the State CEQA guidelines, the City of San Bernardino (City) (as lead agency) has prepared a Draft Mitigated Negative Declaration (Draft MND) to evaluate the environmental effects associated with the proposed truck sales, service/repair, and parts sales dealership to be located at 776 W Mill Street, in the City of San Bernardino. The Applicant is seeking approval of Land Use Permit. In accordance with Section 15072 of the CEQA Guidelines, the City has prepared this Notice of Intent to provide responsible and interested parties with information about the Project details regarding the public comment period, document availability, and public meetings.

Project Title: **TEC Equipment 776 W Mill Street**
Project Applicant: **TEC Equipment, Inc.**

Project Description:
TEC Equipment, Inc. (Applicant) is requesting the City of San Bernardino's approval of a Land Use Permit for a proposed truck sales, service/repair, and parts sales dealership on an approximately 7-acre site containing a total of five Assessor's Parcel Numbers (0136-151-06, 09, 11, and 19 & 0136-142-02). The Project Site is located at 776 W Mill Street. The development proposed is the establishment of a truck sales and service/repair, and parts sales dealership to include a 5,950 square-foot office building, 168 12-foot by 55-foot trailer truck stalls, 21 12-foot by 30-foot truck stalls and seven passenger car parking spaces. The proposed site improvements include signage, landscaping, decorative perimeter fencing/walls, and a storm water retention basin. The improvements also include easement dedication along the northern and southern property lines. Access to the Project Site is provided by an existing 40 foot driveway on Mill Street.

<u>California Government Code section 65962.5</u>
The Project Site is not part of a Cortese List and is not located on a California Department of Toxic Substances list.

Project Location:
The Project Site comprises five (5) parcels on a 7.08-acre site. The Project Site is in the south-central portion of the City and located at 776 W Mill Street, in the City of San Bernardino. The Project Site is bounded by the Lytle Creek Flood Control Channel to the north and east, Mill Street and commercial uses to the south, and Interstate 215 to the west. Refer to the table below for the General Plan and zoning designations for the surrounding properties:

General Plan Land Use and Zoning Designations

Location	General Plan Designation	Zoning Designation
Project Site	C (Commercial)	CCS-1(Central City South-1)
North	PF (Public Facility/Quasi-Public)	PFC (Publicly Owned Flood Control)
South	I (Industrial); C (Commercial)	IL (Industrial Light); CCS-2 (Central City South-2)
East	PF (Public Facility/Quasi-Public)	PFC (Publicly Owned Flood Control)
West	Interstate 215	Interstate 215

Public Comment Period:
The 30-day public comment period for the Mitigated Negative Declaration begins on December 21, 2021 and closes on January 20, 2022. Please submit comments ***no later than*** 5:00 p.m. on January 20, 2022 to Michael Rosales, Associate Planner, at 290 North D Street San Bernardino, CA 92401 or by email at rosales_mi@sbcity.org.

Document Availability:
Copies of the Mitigated Negative Declaration and Initial Study are available for public review at the following locations:

- **City of San Bernardino Website:**
  http://sbcity.org/cityhall/community_n_economic_development/planning/environmental_documents.asp

- **City of San Bernardino Planning Division – By Appointment Only**
  201 North E Street, 3rd Floor
  San Bernardino, CA 92401
  (909) 384-5357

- **City Clerk's Office – By Appointment Only**
  201 North E Street, Bldg. A
  San Bernardino, CA 92410
  (909) 384-5002

The City has tentatively scheduled the Project for a Development and Environmental Review Committee (D/ERC) meeting on January 26, 2022 at 10:00 am. If you require special accommodations for either of these meetings, or have any other questions, please contact Michael Rosales at least five (5) business days prior to the meeting.

Attachment B
Response To Comments

Appendix A
Air Quality Model Outputs

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

TEC Equipment

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Automobile Care Center	5.95	1000sqft	0.14	5,950.00	0
Other Asphalt Surfaces	234.45	1000sqft	5.38	234,445.00	0
Other Non-Asphalt Surfaces	67.92	1000sqft	1.56	67,924.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Per Site Plan.

Construction Phase - The Project Site is vacant and will not require demolition.

Vehicle Trips - Per 776 W. Mill Street Trip Generation Assessment by Urban Crossroads dated July 14, 2021.

Fleet Mix - Per 776 W. Mill Street Trip Gemeration Assessment by Urban Crossroads dated July 14, 2021.

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblFleetMix	HHD	9.1620e-003	0.08
tblFleetMix	LDA	0.54	0.76

tblFleetMix	LDT1	0.06	0.00
tblFleetMix	LDT2	0.18	0.00
tblFleetMix	LHD1	0.02	0.08
tblFleetMix	LHD2	6.2450e-003	0.08
tblFleetMix	MCY	0.02	0.00
tblFleetMix	MDV	0.13	0.00
tblFleetMix	MH	3.8640e-003	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	8.2600e-004	0.00
tblFleetMix	SBUS	7.4800e-004	0.00
tblFleetMix	UBUS	5.1500e-004	0.00
tblVehicleTrips	ST_TR	23.72	8.40
tblVehicleTrips	SU_TR	11.88	8.40
tblVehicleTrips	WD_TR	23.72	8.40

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.2704	2.3125	2.5446	5.6700e-003	0.3541	0.1060	0.4601	0.1347	0.0993	0.2340	0.0000	508.3069	508.3069	0.0789	0.0178	515.5823
2023	0.1105	0.2823	0.3893	7.8000e-004	0.0219	0.0130	0.0349	5.8800e-003	0.0122	0.0181	0.0000	69.4331	69.4331	0.0128	1.6900e-003	70.2575
Maximum	**0.2704**	**2.3125**	**2.5446**	**5.6700e-003**	**0.3541**	**0.1060**	**0.4601**	**0.1347**	**0.0993**	**0.2340**	**0.0000**	**508.3069**	**508.3069**	**0.0789**	**0.0178**	**515.5823**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.2704	2.3125	2.5446	5.6700e-003	0.2611	0.1060	0.3671	0.0881	0.0993	0.1874	0.0000	508.3065	508.3065	0.0789	0.0178	515.5819
2023	0.1105	0.2823	0.3893	7.8000e-004	0.0219	0.0130	0.0349	5.8800e-003	0.0122	0.0181	0.0000	69.4331	69.4331	0.0128	1.6900e-003	70.2575
Maximum	**0.2704**	**2.3125**	**2.5446**	**5.6700e-003**	**0.2611**	**0.1060**	**0.3671**	**0.0881**	**0.0993**	**0.1874**	**0.0000**	**508.3065**	**508.3065**	**0.0789**	**0.0178**	**515.5819**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**24.74**	**0.00**	**18.79**	**33.17**	**0.00**	**18.49**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2022**	**3-31-2022**	0.5587	0.5587
2	**4-1-2022**	**6-30-2022**	0.6677	0.6677
3	**7-1-2022**	**9-30-2022**	0.6750	0.6750
4	**10-1-2022**	**12-31-2022**	0.6801	0.6801
5	**1-1-2023**	**3-31-2023**	0.3864	0.3864
		Highest	0.6801	0.6801

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0484	4.0000e-005	3.9400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	7.6500e-003	7.6500e-003	2.0000e-005	0.0000	8.1600e-003
Energy	1.0400e-003	9.4300e-003	7.9200e-003	6.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004	0.0000	24.5079	24.5079	1.0800e-003	3.0000e-004	24.6229
Mobile	0.0101	0.0495	0.0933	3.3000e-004	0.0259	4.1000e-004	0.0263	6.9700e-003	3.9000e-004	7.3600e-003	0.0000	30.8527	30.8527	1.3800e-003	2.6600e-003	31.6801
Waste						0.0000	0.0000		0.0000	0.0000	4.6140	0.0000	4.6140	0.2727	0.0000	11.4310
Water						0.0000	0.0000		0.0000	0.0000	0.1776	2.6786	2.8562	0.0184	4.5000e-004	3.4507
Total	**0.0595**	**0.0589**	**0.1051**	**3.9000e-004**	**0.0259**	**1.1400e-003**	**0.0270**	**6.9700e-003**	**1.1200e-003**	**8.0900e-003**	**4.7916**	**58.0469**	**62.8384**	**0.2936**	**3.4100e-003**	**71.1928**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0484	4.0000e-005	3.9400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	7.6500e-003	7.6500e-003	2.0000e-005	0.0000	8.1600e-003
Energy	1.0400e-003	9.4300e-003	7.9200e-003	6.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004	0.0000	24.5079	24.5079	1.0800e-003	3.0000e-004	24.6229
Mobile	0.0101	0.0495	0.0933	3.3000e-004	0.0259	4.1000e-004	0.0263	6.9700e-003	3.9000e-004	7.3600e-003	0.0000	30.8527	30.8527	1.3800e-003	2.6600e-003	31.6801
Waste						0.0000	0.0000		0.0000	0.0000	4.6140	0.0000	4.6140	0.2727	0.0000	11.4310
Water						0.0000	0.0000		0.0000	0.0000	0.1776	2.6786	2.8562	0.0184	4.5000e-004	3.4507
Total	**0.0595**	**0.0589**	**0.1051**	**3.9000e-004**	**0.0259**	**1.1400e-003**	**0.0270**	**6.9700e-003**	**1.1200e-003**	**8.0900e-003**	**4.7916**	**58.0469**	**62.8384**	**0.2936**	**3.4100e-003**	**71.1928**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/29/2022	2/11/2022	5	10	
2	Grading	Grading	2/12/2022	3/11/2022	5	20	
3	Building Construction	Building Construction	3/12/2022	1/27/2023	5	230	

4	Paving	Paving	1/28/2023	2/24/2023	5	20	
5	Architectural Coating	Architectural Coating	2/25/2023	3/24/2023	5	20	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 20

Acres of Paving: 6.94

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 8,925; Non-Residential Outdoor: 2,975; Striped Parking Area: 18,142 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Building Construction	Cranes	1	7.00	231	0.29
Grading	Excavators	1	8.00	158	0.38
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	129.00	51.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	26.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0159	0.1654	0.0985	1.9000e-004		8.0600e-003	8.0600e-003		7.4200e-003	7.4200e-003	0.0000	16.7197	16.7197	5.4100e-003	0.0000	16.8549
Total	**0.0159**	**0.1654**	**0.0985**	**1.9000e-004**	**0.0983**	**8.0600e-003**	**0.1064**	**0.0505**	**7.4200e-003**	**0.0579**	**0.0000**	**16.7197**	**16.7197**	**5.4100e-003**	**0.0000**	**16.8549**

3.2 Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	2.4000e-004	3.1900e-003	1.0000e-005	9.9000e-004	1.0000e-005	9.9000e-004	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.7984	0.7984	2.0000e-005	2.0000e-005	0.8054
Total	**3.0000e-004**	**2.4000e-004**	**3.1900e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**9.9000e-004**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.7984**	**0.7984**	**2.0000e-005**	**2.0000e-005**	**0.8054**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0442	0.0000	0.0442	0.0227	0.0000	0.0227	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0159	0.1654	0.0985	1.9000e-004		8.0600e-003	8.0600e-003		7.4200e-003	7.4200e-003	0.0000	16.7197	16.7197	5.4100e-003	0.0000	16.8549
Total	**0.0159**	**0.1654**	**0.0985**	**1.9000e-004**	**0.0442**	**8.0600e-003**	**0.0523**	**0.0227**	**7.4200e-003**	**0.0302**	**0.0000**	**16.7197**	**16.7197**	**5.4100e-003**	**0.0000**	**16.8549**

3.2 Site Preparation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	2.4000e-004	3.1900e-003	1.0000e-005	9.9000e-004	1.0000e-005	9.9000e-004	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.7984	0.7984	2.0000e-005	2.0000e-005	0.8054
Total	**3.0000e-004**	**2.4000e-004**	**3.1900e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**9.9000e-004**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.7984**	**0.7984**	**2.0000e-005**	**2.0000e-005**	**0.8054**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0708	0.0000	0.0708	0.0343	0.0000	0.0343	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0195	0.2086	0.1527	3.0000e-004		9.4100e-003	9.4100e-003		8.6600e-003	8.6600e-003	0.0000	26.0548	26.0548	8.4300e-003	0.0000	26.2654
Total	**0.0195**	**0.2086**	**0.1527**	**3.0000e-004**	**0.0708**	**9.4100e-003**	**0.0802**	**0.0343**	**8.6600e-003**	**0.0429**	**0.0000**	**26.0548**	**26.0548**	**8.4300e-003**	**0.0000**	**26.2654**

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	4.1000e-004	5.3100e-003	1.0000e-005	1.6500e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3306	1.3306	4.0000e-005	4.0000e-005	1.3423
Total	**5.0000e-004**	**4.1000e-004**	**5.3100e-003**	**1.0000e-005**	**1.6500e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.3306**	**1.3306**	**4.0000e-005**	**4.0000e-005**	**1.3423**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0319	0.0000	0.0319	0.0154	0.0000	0.0154	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0195	0.2086	0.1527	3.0000e-004		9.4100e-003	9.4100e-003		8.6600e-003	8.6600e-003	0.0000	26.0547	26.0547	8.4300e-003	0.0000	26.2654
Total	**0.0195**	**0.2086**	**0.1527**	**3.0000e-004**	**0.0319**	**9.4100e-003**	**0.0413**	**0.0154**	**8.6600e-003**	**0.0241**	**0.0000**	**26.0547**	**26.0547**	**8.4300e-003**	**0.0000**	**26.2654**

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	4.1000e-004	5.3100e-003	1.0000e-005	1.6500e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3306	1.3306	4.0000e-005	4.0000e-005	1.3423
Total	**5.0000e-004**	**4.1000e-004**	**5.3100e-003**	**1.0000e-005**	**1.6500e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.3306**	**1.3306**	**4.0000e-005**	**4.0000e-005**	**1.3423**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1792	1.6396	1.7182	2.8300e-003		0.0850	0.0850		0.0799	0.0799	0.0000	243.3115	243.3115	0.0583	0.0000	244.7688
Total	**0.1792**	**1.6396**	**1.7182**	**2.8300e-003**		**0.0850**	**0.0850**		**0.0799**	**0.0799**	**0.0000**	**243.3115**	**243.3115**	**0.0583**	**0.0000**	**244.7688**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.6600e-003	0.2615	0.0868	1.0200e-003	0.0338	2.6100e-003	0.0364	9.7400e-003	2.5000e-003	0.0122	0.0000	99.9348	99.9348	3.3400e-003	0.0145	104.3397
Worker	0.0455	0.0367	0.4799	1.3100e-003	0.1486	9.0000e-004	0.1495	0.0395	8.3000e-004	0.0403	0.0000	120.1571	120.1571	3.3300e-003	3.2400e-003	121.2059
Total	**0.0551**	**0.2982**	**0.5667**	**2.3300e-003**	**0.1824**	**3.5100e-003**	**0.1859**	**0.0492**	**3.3300e-003**	**0.0525**	**0.0000**	**220.0919**	**220.0919**	**6.6700e-003**	**0.0177**	**225.5456**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1792	1.6396	1.7182	2.8300e-003		0.0850	0.0850		0.0799	0.0799	0.0000	243.3112	243.3112	0.0583	0.0000	244.7685
Total	**0.1792**	**1.6396**	**1.7182**	**2.8300e-003**		**0.0850**	**0.0850**		**0.0799**	**0.0799**	**0.0000**	**243.3112**	**243.3112**	**0.0583**	**0.0000**	**244.7685**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.6600e-003	0.2615	0.0868	1.0200e-003	0.0338	2.6100e-003	0.0364	9.7400e-003	2.5000e-003	0.0122	0.0000	99.9348	99.9348	3.3400e-003	0.0145	104.3397
Worker	0.0455	0.0367	0.4799	1.3100e-003	0.1486	9.0000e-004	0.1495	0.0395	8.3000e-004	0.0403	0.0000	120.1571	120.1571	3.3300e-003	3.2400e-003	121.2059
Total	**0.0551**	**0.2982**	**0.5667**	**2.3300e-003**	**0.1824**	**3.5100e-003**	**0.1859**	**0.0492**	**3.3300e-003**	**0.0525**	**0.0000**	**220.0919**	**220.0919**	**6.6700e-003**	**0.0177**	**225.5456**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0157	0.1439	0.1624	2.7000e-004		7.0000e-003	7.0000e-003		6.5800e-003	6.5800e-003	0.0000	23.1805	23.1805	5.5100e-003	0.0000	23.3183
Total	**0.0157**	**0.1439**	**0.1624**	**2.7000e-004**		**7.0000e-003**	**7.0000e-003**		**6.5800e-003**	**6.5800e-003**	**0.0000**	**23.1805**	**23.1805**	**5.5100e-003**	**0.0000**	**23.3183**

3.4 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5000e-004	0.0194	7.4000e-003	9.0000e-005	3.2200e-003	1.1000e-004	3.3200e-003	9.3000e-004	1.0000e-004	1.0300e-003	0.0000	9.0766	9.0766	3.0000e-004	1.3200e-003	9.4761
Worker	4.0200e-003	3.0900e-003	0.0421	1.2000e-004	0.0142	8.0000e-005	0.0142	3.7600e-003	7.0000e-005	3.8300e-003	0.0000	11.0758	11.0758	2.8000e-004	2.8000e-004	11.1678
Total	**4.5700e-003**	**0.0225**	**0.0495**	**2.1000e-004**	**0.0174**	**1.9000e-004**	**0.0176**	**4.6900e-003**	**1.7000e-004**	**4.8600e-003**	**0.0000**	**20.1523**	**20.1523**	**5.8000e-004**	**1.6000e-003**	**20.6439**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0157	0.1439	0.1624	2.7000e-004		7.0000e-003	7.0000e-003		6.5800e-003	6.5800e-003	0.0000	23.1805	23.1805	5.5100e-003	0.0000	23.3183
Total	**0.0157**	**0.1439**	**0.1624**	**2.7000e-004**		**7.0000e-003**	**7.0000e-003**		**6.5800e-003**	**6.5800e-003**	**0.0000**	**23.1805**	**23.1805**	**5.5100e-003**	**0.0000**	**23.3183**

3.4 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5000e-004	0.0194	7.4000e-003	9.0000e-005	3.2200e-003	1.1000e-004	3.3200e-003	9.3000e-004	1.0000e-004	1.0300e-003	0.0000	9.0766	9.0766	3.0000e-004	1.3200e-003	9.4761
Worker	4.0200e-003	3.0900e-003	0.0421	1.2000e-004	0.0142	8.0000e-005	0.0142	3.7600e-003	7.0000e-005	3.8300e-003	0.0000	11.0758	11.0758	2.8000e-004	2.8000e-004	11.1678
Total	**4.5700e-003**	**0.0225**	**0.0495**	**2.1000e-004**	**0.0174**	**1.9000e-004**	**0.0176**	**4.6900e-003**	**1.7000e-004**	**4.8600e-003**	**0.0000**	**20.1523**	**20.1523**	**5.8000e-004**	**1.6000e-003**	**20.6439**

3.5 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0103	0.1019	0.1458	2.3000e-004		5.1000e-003	5.1000e-003		4.6900e-003	4.6900e-003	0.0000	20.0269	20.0269	6.4800e-003	0.0000	20.1888
Paving	7.0500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0174**	**0.1019**	**0.1458**	**2.3000e-004**		**5.1000e-003**	**5.1000e-003**		**4.6900e-003**	**4.6900e-003**	**0.0000**	**20.0269**	**20.0269**	**6.4800e-003**	**0.0000**	**20.1888**

3.5 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.7000e-004	3.6000e-004	4.8900e-003	1.0000e-005	1.6500e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.2879	1.2879	3.0000e-005	3.0000e-005	1.2986
Total	**4.7000e-004**	**3.6000e-004**	**4.8900e-003**	**1.0000e-005**	**1.6500e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.2879**	**1.2879**	**3.0000e-005**	**3.0000e-005**	**1.2986**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0103	0.1019	0.1458	2.3000e-004		5.1000e-003	5.1000e-003		4.6900e-003	4.6900e-003	0.0000	20.0268	20.0268	6.4800e-003	0.0000	20.1888
Paving	7.0500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0174**	**0.1019**	**0.1458**	**2.3000e-004**		**5.1000e-003**	**5.1000e-003**		**4.6900e-003**	**4.6900e-003**	**0.0000**	**20.0268**	**20.0268**	**6.4800e-003**	**0.0000**	**20.1888**

3.5 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.7000e-004	3.6000e-004	4.8900e-003	1.0000e-005	1.6500e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.2879	1.2879	3.0000e-005	3.0000e-005	1.2986
Total	**4.7000e-004**	**3.6000e-004**	**4.8900e-003**	**1.0000e-005**	**1.6500e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.2879**	**1.2879**	**3.0000e-005**	**3.0000e-005**	**1.2986**

3.6 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0696					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9200e-003	0.0130	0.0181	3.0000e-005		7.1000e-004	7.1000e-004		7.1000e-004	7.1000e-004	0.0000	2.5533	2.5533	1.5000e-004	0.0000	2.5571
Total	**0.0715**	**0.0130**	**0.0181**	**3.0000e-005**		**7.1000e-004**	**7.1000e-004**		**7.1000e-004**	**7.1000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.5000e-004**	**0.0000**	**2.5571**

3.6 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.1000e-004	6.2000e-004	8.4800e-003	2.0000e-005	2.8500e-003	2.0000e-005	2.8700e-003	7.6000e-004	2.0000e-005	7.7000e-004	0.0000	2.2323	2.2323	6.0000e-005	6.0000e-005	2.2509
Total	**8.1000e-004**	**6.2000e-004**	**8.4800e-003**	**2.0000e-005**	**2.8500e-003**	**2.0000e-005**	**2.8700e-003**	**7.6000e-004**	**2.0000e-005**	**7.7000e-004**	**0.0000**	**2.2323**	**2.2323**	**6.0000e-005**	**6.0000e-005**	**2.2509**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0696					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9200e-003	0.0130	0.0181	3.0000e-005		7.1000e-004	7.1000e-004		7.1000e-004	7.1000e-004	0.0000	2.5533	2.5533	1.5000e-004	0.0000	2.5571
Total	**0.0715**	**0.0130**	**0.0181**	**3.0000e-005**		**7.1000e-004**	**7.1000e-004**		**7.1000e-004**	**7.1000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.5000e-004**	**0.0000**	**2.5571**

3.6 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.1000e-004	6.2000e-004	8.4800e-003	2.0000e-005	2.8500e-003	2.0000e-005	2.8700e-003	7.6000e-004	2.0000e-005	7.7000e-004	0.0000	2.2323	2.2323	6.0000e-005	6.0000e-005	2.2509
Total	**8.1000e-004**	**6.2000e-004**	**8.4800e-003**	**2.0000e-005**	**2.8500e-003**	**2.0000e-005**	**2.8700e-003**	**7.6000e-004**	**2.0000e-005**	**7.7000e-004**	**0.0000**	**2.2323**	**2.2323**	**6.0000e-005**	**6.0000e-005**	**2.2509**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0101	0.0495	0.0933	3.3000e-004	0.0259	4.1000e-004	0.0263	6.9700e-003	3.9000e-004	7.3600e-003	0.0000	30.8527	30.8527	1.3800e-003	2.6600e-003	31.6801
Unmitigated	0.0101	0.0495	0.0933	3.3000e-004	0.0259	4.1000e-004	0.0263	6.9700e-003	3.9000e-004	7.3600e-003	0.0000	30.8527	30.8527	1.3800e-003	2.6600e-003	31.6801

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Automobile Care Center	50.00	50.00	50.00	66,975	66,975
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	50.00	50.00	50.00	66,975	66,975

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Automobile Care Center	16.60	8.40	6.90	33.00	48.00	19.00	21	51	28
Other Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Automobile Care Center	0.760000	0.000000	0.000000	0.000000	0.080000	0.080000	0.000000	0.080000	0.000000	0.000000	0.000000	0.000000	0.000000
Other Asphalt Surfaces	0.543376	0.059966	0.184357	0.131187	0.023843	0.006245	0.012012	0.009162	0.000826	0.000515	0.023898	0.000748	0.003864

Other Non-Asphalt Surfaces	0.543376	0.059966	0.184357	0.131187	0.023843	0.006245	0.012012	0.009162	0.000826	0.000515	0.023898	0.000748	0.003864

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	14.2426	14.2426	8.8000e-004	1.1000e-004	14.2966
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	14.2426	14.2426	8.8000e-004	1.1000e-004	14.2966
NaturalGas Mitigated	1.0400e-003	9.4300e-003	7.9200e-003	6.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004	0.0000	10.2653	10.2653	2.0000e-004	1.9000e-004	10.3263
NaturalGas Unmitigated	1.0400e-003	9.4300e-003	7.9200e-003	6.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004	0.0000	10.2653	10.2653	2.0000e-004	1.9000e-004	10.3263

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Automobile Care Center	192364	1.0400e-003	9.4300e-003	7.9200e-003	6.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004	0.0000	10.2653	10.2653	2.0000e-004	1.9000e-004	10.3263
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**1.0400e-003**	**9.4300e-003**	**7.9200e-003**	**6.0000e-005**		**7.2000e-004**	**7.2000e-004**		**7.2000e-004**	**7.2000e-004**	**0.0000**	**10.2653**	**10.2653**	**2.0000e-004**	**1.9000e-004**	**10.3263**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Automobile Care Center	192364	1.0400e-003	9.4300e-003	7.9200e-003	6.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004	0.0000	10.2653	10.2653	2.0000e-004	1.9000e-004	10.3263
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**1.0400e-003**	**9.4300e-003**	**7.9200e-003**	**6.0000e-005**		**7.2000e-004**	**7.2000e-004**		**7.2000e-004**	**7.2000e-004**	**0.0000**	**10.2653**	**10.2653**	**2.0000e-004**	**1.9000e-004**	**10.3263**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Automobile Care Center	59024	14.2426	8.8000e-004	1.1000e-004	14.2966
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**14.2426**	**8.8000e-004**	**1.1000e-004**	**14.2966**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Automobile Care Center	59024	14.2426	8.8000e-004	1.1000e-004	14.2966
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**14.2426**	**8.8000e-004**	**1.1000e-004**	**14.2966**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0484	4.0000e-005	3.9400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	7.6500e-003	7.6500e-003	2.0000e-005	0.0000	8.1600e-003
Unmitigated	0.0484	4.0000e-005	3.9400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	7.6500e-003	7.6500e-003	2.0000e-005	0.0000	8.1600e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	6.9600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0411					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.7000e-004	4.0000e-005	3.9400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	7.6500e-003	7.6500e-003	2.0000e-005	0.0000	8.1600e-003
Total	**0.0484**	**4.0000e-005**	**3.9400e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**7.6500e-003**	**7.6500e-003**	**2.0000e-005**	**0.0000**	**8.1600e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	6.9600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0411					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.7000e-004	4.0000e-005	3.9400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	7.6500e-003	7.6500e-003	2.0000e-005	0.0000	8.1600e-003
Total	**0.0484**	**4.0000e-005**	**3.9400e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**7.6500e-003**	**7.6500e-003**	**2.0000e-005**	**0.0000**	**8.1600e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	2.8562	0.0184	4.5000e-004	3.4507
Unmitigated	2.8562	0.0184	4.5000e-004	3.4507

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Automobile Care Center	0.559783 / 0.343093	2.8562	0.0184	4.5000e-004	3.4507
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**2.8562**	**0.0184**	**4.5000e-004**	**3.4507**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Automobile Care Center	0.559783 / 0.343093	2.8562	0.0184	4.5000e-004	3.4507
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**2.8562**	**0.0184**	**4.5000e-004**	**3.4507**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	4.6140	0.2727	0.0000	11.4310
Unmitigated	4.6140	0.2727	0.0000	11.4310

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Automobile Care Center	22.73	4.6140	0.2727	0.0000	11.4310
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**4.6140**	**0.2727**	**0.0000**	**11.4310**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Automobile Care Center	22.73	4.6140	0.2727	0.0000	11.4310
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**4.6140**	**0.2727**	**0.0000**	**11.4310**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

TEC Equipment

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Automobile Care Center	5.95	1000sqft	0.14	5,950.00	0
Other Asphalt Surfaces	234.45	1000sqft	5.38	234,445.00	0
Other Non-Asphalt Surfaces	67.92	1000sqft	1.56	67,924.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Per Site Plan.

Construction Phase - The Project Site is vacant and will not require demolition.

Vehicle Trips - Per 776 W. Mill Street Trip Generation Assessment by Urban Crossroads dated July 14, 2021.

Fleet Mix - Per 776 W. Mill Street Trip Gemeration Assessment by Urban Crossroads dated July 14, 2021.

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblFleetMix	HHD	9.1620e-003	0.08
tblFleetMix	LDA	0.54	0.76

tblFleetMix	LDT1	0.06	0.00
tblFleetMix	LDT2	0.18	0.00
tblFleetMix	LHD1	0.02	0.08
tblFleetMix	LHD2	6.2450e-003	0.08
tblFleetMix	MCY	0.02	0.00
tblFleetMix	MDV	0.13	0.00
tblFleetMix	MH	3.8640e-003	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	8.2600e-004	0.00
tblFleetMix	SBUS	7.4800e-004	0.00
tblFleetMix	UBUS	5.1500e-004	0.00
tblVehicleTrips	ST_TR	23.72	8.40
tblVehicleTrips	SU_TR	11.88	8.40
tblVehicleTrips	WD_TR	23.72	8.40

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	3.2321	33.1271	22.0941	0.0497	19.8582	1.6138	21.4720	10.1558	1.4847	11.6405	0.0000	4,922.3139	4,922.3139	1.1970	0.1836	4,994.0748
2023	7.2369	16.5126	21.4980	0.0489	1.7685	0.7186	2.4871	0.4764	0.6762	1.1526	0.0000	4,831.5420	4,831.5420	0.7176	0.1739	4,900.1714
Maximum	**7.2369**	**33.1271**	**22.0941**	**0.0497**	**19.8582**	**1.6138**	**21.4720**	**10.1558**	**1.4847**	**11.6405**	**0.0000**	**4,922.3139**	**4,922.3139**	**1.1970**	**0.1836**	**4,994.0748**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	3.2321	33.1271	22.0941	0.0497	9.0469	1.6138	10.6606	4.5995	1.4847	6.0841	0.0000	4,922.3139	4,922.3139	1.1970	0.1836	4,994.0748
2023	7.2369	16.5126	21.4980	0.0489	1.7685	0.7186	2.4871	0.4764	0.6762	1.1526	0.0000	4,831.5420	4,831.5420	0.7176	0.1739	4,900.1714
Maximum	**7.2369**	**33.1271**	**22.0941**	**0.0497**	**9.0469**	**1.6138**	**10.6606**	**4.5995**	**1.4847**	**6.0841**	**0.0000**	**4,922.3139**	**4,922.3139**	**1.1970**	**0.1836**	**4,994.0748**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**49.99**	**0.00**	**45.12**	**52.26**	**0.00**	**43.43**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2660	2.9000e-004	0.0315	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0675	0.0675	1.8000e-004		0.0719
Energy	5.6800e-003	0.0517	0.0434	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003		62.0027	62.0027	1.1900e-003	1.1400e-003	62.3712
Mobile	0.0589	0.2587	0.5116	1.8400e-003	0.1446	2.2500e-003	0.1468	0.0389	2.1300e-003	0.0411		191.2302	191.2302	8.0200e-003	0.0159	196.1646
Total	**0.3306**	**0.3106**	**0.5866**	**2.1500e-003**	**0.1446**	**6.2900e-003**	**0.1509**	**0.0389**	**6.1700e-003**	**0.0451**		**253.3005**	**253.3005**	**9.3900e-003**	**0.0170**	**258.6077**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2660	2.9000e-004	0.0315	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0675	0.0675	1.8000e-004		0.0719
Energy	5.6800e-003	0.0517	0.0434	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003		62.0027	62.0027	1.1900e-003	1.1400e-003	62.3712
Mobile	0.0589	0.2587	0.5116	1.8400e-003	0.1446	2.2500e-003	0.1468	0.0389	2.1300e-003	0.0411		191.2302	191.2302	8.0200e-003	0.0159	196.1646
Total	**0.3306**	**0.3106**	**0.5866**	**2.1500e-003**	**0.1446**	**6.2900e-003**	**0.1509**	**0.0389**	**6.1700e-003**	**0.0451**		**253.3005**	**253.3005**	**9.3900e-003**	**0.0170**	**258.6077**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/29/2022	2/11/2022	5	10	
2	Grading	Grading	2/12/2022	3/11/2022	5	20	
3	Building Construction	Building Construction	3/12/2022	1/27/2023	5	230	
4	Paving	Paving	1/28/2023	2/24/2023	5	20	
5	Architectural Coating	Architectural Coating	2/25/2023	3/24/2023	5	20	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 20

Acres of Paving: 6.94

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 8,925; Non-Residential Outdoor: 2,975; Striped Parking Area: 18,142 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Building Construction	Cranes	1	7.00	231	0.29
Grading	Excavators	1	8.00	158	0.38
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41

Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	129.00	51.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	26.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836		3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**19.6570**	**1.6126**	**21.2696**	**10.1025**	**1.4836**	**11.5860**		**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0620	0.0436	0.6861	1.8200e-003	0.2012	1.2000e-003	0.2024	0.0534	1.1000e-003	0.0545		184.0558	184.0558	4.8100e-003	4.4000e-003	185.4883
Total	**0.0620**	**0.0436**	**0.6861**	**1.8200e-003**	**0.2012**	**1.2000e-003**	**0.2024**	**0.0534**	**1.1000e-003**	**0.0545**		**184.0558**	**184.0558**	**4.8100e-003**	**4.4000e-003**	**185.4883**

3.2 Site Preparation - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.8457	0.0000	8.8457	4.5461	0.0000	4.5461			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836	0.0000	3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**8.8457**	**1.6126**	**10.4582**	**4.5461**	**1.4836**	**6.0297**	**0.0000**	**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0620	0.0436	0.6861	1.8200e-003	0.2012	1.2000e-003	0.2024	0.0534	1.1000e-003	0.0545		184.0558	184.0558	4.8100e-003	4.4000e-003	185.4883
Total	**0.0620**	**0.0436**	**0.6861**	**1.8200e-003**	**0.2012**	**1.2000e-003**	**0.2024**	**0.0534**	**1.1000e-003**	**0.0545**		**184.0558**	**184.0558**	**4.8100e-003**	**4.4000e-003**	**185.4883**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656		2,872.0464	2,872.0464	0.9289		2,895.2684
Total	**1.9486**	**20.8551**	**15.2727**	**0.0297**	**7.0826**	**0.9409**	**8.0234**	**3.4247**	**0.8656**	**4.2903**		**2,872.0464**	**2,872.0464**	**0.9289**		**2,895.2684**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0516	0.0363	0.5718	1.5200e-003	0.1677	1.0000e-003	0.1687	0.0445	9.2000e-004	0.0454		153.3798	153.3798	4.0100e-003	3.6700e-003	154.5736
Total	**0.0516**	**0.0363**	**0.5718**	**1.5200e-003**	**0.1677**	**1.0000e-003**	**0.1687**	**0.0445**	**9.2000e-004**	**0.0454**		**153.3798**	**153.3798**	**4.0100e-003**	**3.6700e-003**	**154.5736**

3.3 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.1872	0.0000	3.1872	1.5411	0.0000	1.5411			0.0000			0.0000
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656	0.0000	2,872.0464	2,872.0464	0.9289		2,895.2684
Total	**1.9486**	**20.8551**	**15.2727**	**0.0297**	**3.1872**	**0.9409**	**4.1280**	**1.5411**	**0.8656**	**2.4067**	**0.0000**	**2,872.0464**	**2,872.0464**	**0.9289**		**2,895.2684**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0516	0.0363	0.5718	1.5200e-003	0.1677	1.0000e-003	0.1687	0.0445	9.2000e-004	0.0454		153.3798	153.3798	4.0100e-003	3.6700e-003	154.5736
Total	**0.0516**	**0.0363**	**0.5718**	**1.5200e-003**	**0.1677**	**1.0000e-003**	**0.1687**	**0.0445**	**9.2000e-004**	**0.0454**		**153.3798**	**153.3798**	**4.0100e-003**	**3.6700e-003**	**154.5736**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0930	2.3731	0.8136	9.7500e-003	0.3266	0.0248	0.3514	0.0940	0.0237	0.1178		1,048.9137	1,048.9137	0.0352	0.1521	1,095.1094
Worker	0.4441	0.3124	4.9171	0.0131	1.4419	8.6000e-003	1.4505	0.3824	7.9200e-003	0.3903		1,319.0667	1,319.0667	0.0345	0.0316	1,329.3331
Total	**0.5371**	**2.6856**	**5.7307**	**0.0228**	**1.7685**	**0.0334**	**1.8019**	**0.4764**	**0.0317**	**0.5081**		**2,367.9803**	**2,367.9803**	**0.0696**	**0.1836**	**2,424.4425**

3.4 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0930	2.3731	0.8136	9.7500e-003	0.3266	0.0248	0.3514	0.0940	0.0237	0.1178		1,048.9137	1,048.9137	0.0352	0.1521	1,095.1094
Worker	0.4441	0.3124	4.9171	0.0131	1.4419	8.6000e-003	1.4505	0.3824	7.9200e-003	0.3903		1,319.0667	1,319.0667	0.0345	0.0316	1,329.3331
Total	**0.5371**	**2.6856**	**5.7307**	**0.0228**	**1.7685**	**0.0334**	**1.8019**	**0.4764**	**0.0317**	**0.5081**		**2,367.9803**	**2,367.9803**	**0.0696**	**0.1836**	**2,424.4425**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0564	1.8513	0.7289	9.2800e-003	0.3266	0.0108	0.3373	0.0940	0.0103	0.1043		999.7577	999.7577	0.0336	0.1447	1,043.7285
Worker	0.4118	0.2764	4.5252	0.0126	1.4419	8.1000e-003	1.4500	0.3824	7.4500e-003	0.3899		1,276.5744	1,276.5744	0.0309	0.0292	1,286.0369
Total	**0.4682**	**2.1277**	**5.2540**	**0.0219**	**1.7685**	**0.0189**	**1.7874**	**0.4764**	**0.0178**	**0.4942**		**2,276.3321**	**2,276.3321**	**0.0645**	**0.1739**	**2,329.7653**

3.4 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0564	1.8513	0.7289	9.2800e-003	0.3266	0.0108	0.3373	0.0940	0.0103	0.1043		999.7577	999.7577	0.0336	0.1447	1,043.7285
Worker	0.4118	0.2764	4.5252	0.0126	1.4419	8.1000e-003	1.4500	0.3824	7.4500e-003	0.3899		1,276.5744	1,276.5744	0.0309	0.0292	1,286.0369
Total	**0.4682**	**2.1277**	**5.2540**	**0.0219**	**1.7685**	**0.0189**	**1.7874**	**0.4764**	**0.0178**	**0.4942**		**2,276.3321**	**2,276.3321**	**0.0645**	**0.1739**	**2,329.7653**

3.5 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694		2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.7048					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.7375**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**		**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0479	0.0321	0.5262	1.4700e-003	0.1677	9.4000e-004	0.1686	0.0445	8.7000e-004	0.0453		148.4389	148.4389	3.6000e-003	3.3900e-003	149.5392
Total	**0.0479**	**0.0321**	**0.5262**	**1.4700e-003**	**0.1677**	**9.4000e-004**	**0.1686**	**0.0445**	**8.7000e-004**	**0.0453**		**148.4389**	**148.4389**	**3.6000e-003**	**3.3900e-003**	**149.5392**

3.5 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694	0.0000	2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.7048					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.7375**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**	**0.0000**	**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0479	0.0321	0.5262	1.4700e-003	0.1677	9.4000e-004	0.1686	0.0445	8.7000e-004	0.0453		148.4389	148.4389	3.6000e-003	3.3900e-003	149.5392
Total	**0.0479**	**0.0321**	**0.5262**	**1.4700e-003**	**0.1677**	**9.4000e-004**	**0.1686**	**0.0445**	**8.7000e-004**	**0.0453**		**148.4389**	**148.4389**	**3.6000e-003**	**3.3900e-003**	**149.5392**

3.6 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	6.9622					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**7.1539**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0830	0.0557	0.9121	2.5500e-003	0.2906	1.6300e-003	0.2923	0.0771	1.5000e-003	0.0786		257.2941	257.2941	6.2400e-003	5.8800e-003	259.2012
Total	**0.0830**	**0.0557**	**0.9121**	**2.5500e-003**	**0.2906**	**1.6300e-003**	**0.2923**	**0.0771**	**1.5000e-003**	**0.0786**		**257.2941**	**257.2941**	**6.2400e-003**	**5.8800e-003**	**259.2012**

3.6 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	6.9622					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**7.1539**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0830	0.0557	0.9121	2.5500e-003	0.2906	1.6300e-003	0.2923	0.0771	1.5000e-003	0.0786		257.2941	257.2941	6.2400e-003	5.8800e-003	259.2012
Total	**0.0830**	**0.0557**	**0.9121**	**2.5500e-003**	**0.2906**	**1.6300e-003**	**0.2923**	**0.0771**	**1.5000e-003**	**0.0786**		**257.2941**	**257.2941**	**6.2400e-003**	**5.8800e-003**	**259.2012**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0589	0.2587	0.5116	1.8400e-003	0.1446	2.2500e-003	0.1468	0.0389	2.1300e-003	0.0411		191.2302	191.2302	8.0200e-003	0.0159	196.1646
Unmitigated	0.0589	0.2587	0.5116	1.8400e-003	0.1446	2.2500e-003	0.1468	0.0389	2.1300e-003	0.0411		191.2302	191.2302	8.0200e-003	0.0159	196.1646

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Automobile Care Center	50.00	50.00	50.00	66,975	66,975
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	50.00	50.00	50.00	66,975	66,975

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Automobile Care Center	16.60	8.40	6.90	33.00	48.00	19.00	21	51	28
Other Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Automobile Care Center	0.760000	0.000000	0.000000	0.000000	0.080000	0.080000	0.000000	0.080000	0.000000	0.000000	0.000000	0.000000	0.000000
Other Asphalt Surfaces	0.543376	0.059966	0.184357	0.131187	0.023843	0.006245	0.012012	0.009162	0.000826	0.000515	0.023898	0.000748	0.003864
Other Non-Asphalt Surfaces	0.543376	0.059966	0.184357	0.131187	0.023843	0.006245	0.012012	0.009162	0.000826	0.000515	0.023898	0.000748	0.003864

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	5.6800e-003	0.0517	0.0434	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003		62.0027	62.0027	1.1900e-003	1.1400e-003	62.3712
NaturalGas Unmitigated	5.6800e-003	0.0517	0.0434	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003		62.0027	62.0027	1.1900e-003	1.1400e-003	62.3712

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Automobile Care Center	527.023	5.6800e-003	0.0517	0.0434	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003		62.0027	62.0027	1.1900e-003	1.1400e-003	62.3712
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**5.6800e-003**	**0.0517**	**0.0434**	**3.1000e-004**		**3.9300e-003**	**3.9300e-003**		**3.9300e-003**	**3.9300e-003**		**62.0027**	**62.0027**	**1.1900e-003**	**1.1400e-003**	**62.3712**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Automobile Care Center	0.527023	5.6800e-003	0.0517	0.0434	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003		62.0027	62.0027	1.1900e-003	1.1400e-003	62.3712
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**5.6800e-003**	**0.0517**	**0.0434**	**3.1000e-004**		**3.9300e-003**	**3.9300e-003**		**3.9300e-003**	**3.9300e-003**		**62.0027**	**62.0027**	**1.1900e-003**	**1.1400e-003**	**62.3712**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.2660	2.9000e-004	0.0315	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0675	0.0675	1.8000e-004		0.0719
Unmitigated	0.2660	2.9000e-004	0.0315	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0675	0.0675	1.8000e-004		0.0719

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0382					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2249					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9300e-003	2.9000e-004	0.0315	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0675	0.0675	1.8000e-004		0.0719
Total	**0.2660**	**2.9000e-004**	**0.0315**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.1000e-004**	**1.1000e-004**		**0.0675**	**0.0675**	**1.8000e-004**		**0.0719**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0382					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2249					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9300e-003	2.9000e-004	0.0315	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0675	0.0675	1.8000e-004		0.0719
Total	**0.2660**	**2.9000e-004**	**0.0315**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.1000e-004**	**1.1000e-004**		**0.0675**	**0.0675**	**1.8000e-004**		**0.0719**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

TEC Equipment

South Coast AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Automobile Care Center	5.95	1000sqft	0.14	5,950.00	0
Other Asphalt Surfaces	234.45	1000sqft	5.38	234,445.00	0
Other Non-Asphalt Surfaces	67.92	1000sqft	1.56	67,924.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Per Site Plan.

Construction Phase - The Project Site is vacant and will not require demolition.

Vehicle Trips - Per 776 W. Mill Street Trip Generation Assessment by Urban Crossroads dated July 14, 2021.

Fleet Mix - Per 776 W. Mill Street Trip Gemeration Assessment by Urban Crossroads dated July 14, 2021.

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblFleetMix	HHD	9.1620e-003	0.08
tblFleetMix	LDA	0.54	0.76

tblFleetMix	LDT1	0.06	0.00
tblFleetMix	LDT2	0.18	0.00
tblFleetMix	LHD1	0.02	0.08
tblFleetMix	LHD2	6.2450e-003	0.08
tblFleetMix	MCY	0.02	0.00
tblFleetMix	MDV	0.13	0.00
tblFleetMix	MH	3.8640e-003	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	8.2600e-004	0.00
tblFleetMix	SBUS	7.4800e-004	0.00
tblFleetMix	UBUS	5.1500e-004	0.00
tblVehicleTrips	ST_TR	23.72	8.40
tblVehicleTrips	SU_TR	11.88	8.40
tblVehicleTrips	WD_TR	23.72	8.40

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	3.2353	33.1312	21.6513	0.0490	19.8582	1.6138	21.4720	10.1558	1.4847	11.6405	0.0000	4,846.1417	4,846.1417	1.1970	0.1858	4,918.5434
2023	7.2415	16.6302	21.0915	0.0481	1.7685	0.7187	2.4871	0.4764	0.6762	1.1527	0.0000	4,759.2693	4,759.2693	0.7176	0.1761	4,828.5484
Maximum	**7.2415**	**33.1312**	**21.6513**	**0.0490**	**19.8582**	**1.6138**	**21.4720**	**10.1558**	**1.4847**	**11.6405**	**0.0000**	**4,846.1417**	**4,846.1417**	**1.1970**	**0.1858**	**4,918.5434**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	3.2353	33.1312	21.6513	0.0490	9.0469	1.6138	10.6606	4.5995	1.4847	6.0841	0.0000	4,846.1417	4,846.1417	1.1970	0.1858	4,918.5434
2023	7.2415	16.6302	21.0915	0.0481	1.7685	0.7187	2.4871	0.4764	0.6762	1.1527	0.0000	4,759.2693	4,759.2693	0.7176	0.1761	4,828.5484
Maximum	**7.2415**	**33.1312**	**21.6513**	**0.0490**	**9.0469**	**1.6138**	**10.6606**	**4.5995**	**1.4847**	**6.0841**	**0.0000**	**4,846.1417**	**4,846.1417**	**1.1970**	**0.1858**	**4,918.5434**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**49.99**	**0.00**	**45.12**	**52.26**	**0.00**	**43.43**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2660	2.9000e-004	0.0315	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0675	0.0675	1.8000e-004		0.0719
Energy	5.6800e-003	0.0517	0.0434	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003		62.0027	62.0027	1.1900e-003	1.1400e-003	62.3712
Mobile	0.0565	0.2720	0.5119	1.7900e-003	0.1446	2.2600e-003	0.1469	0.0389	2.1400e-003	0.0411		185.7763	185.7763	8.4200e-003	0.0161	190.7953
Total	**0.3281**	**0.3239**	**0.5868**	**2.1000e-003**	**0.1446**	**6.3000e-003**	**0.1509**	**0.0389**	**6.1800e-003**	**0.0451**		**247.8465**	**247.8465**	**9.7900e-003**	**0.0173**	**253.2385**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2660	2.9000e-004	0.0315	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0675	0.0675	1.8000e-004		0.0719
Energy	5.6800e-003	0.0517	0.0434	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003		62.0027	62.0027	1.1900e-003	1.1400e-003	62.3712
Mobile	0.0565	0.2720	0.5119	1.7900e-003	0.1446	2.2600e-003	0.1469	0.0389	2.1400e-003	0.0411		185.7763	185.7763	8.4200e-003	0.0161	190.7953
Total	**0.3281**	**0.3239**	**0.5868**	**2.1000e-003**	**0.1446**	**6.3000e-003**	**0.1509**	**0.0389**	**6.1800e-003**	**0.0451**		**247.8465**	**247.8465**	**9.7900e-003**	**0.0173**	**253.2385**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/29/2022	2/11/2022	5	10	
2	Grading	Grading	2/12/2022	3/11/2022	5	20	
3	Building Construction	Building Construction	3/12/2022	1/27/2023	5	230	
4	Paving	Paving	1/28/2023	2/24/2023	5	20	
5	Architectural Coating	Architectural Coating	2/25/2023	3/24/2023	5	20	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 20

Acres of Paving: 6.94

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 8,925; Non-Residential Outdoor: 2,975; Striped Parking Area: 18,142 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Building Construction	Cranes	1	7.00	231	0.29
Grading	Excavators	1	8.00	158	0.38
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41

Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	129.00	51.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	26.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836		3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**19.6570**	**1.6126**	**21.2696**	**10.1025**	**1.4836**	**11.5860**		**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0652	0.0477	0.6202	1.7200e-003	0.2012	1.2000e-003	0.2024	0.0534	1.1000e-003	0.0545		173.3539	173.3539	4.8700e-003	4.6700e-003	174.8680
Total	**0.0652**	**0.0477**	**0.6202**	**1.7200e-003**	**0.2012**	**1.2000e-003**	**0.2024**	**0.0534**	**1.1000e-003**	**0.0545**		**173.3539**	**173.3539**	**4.8700e-003**	**4.6700e-003**	**174.8680**

3.2 Site Preparation - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.8457	0.0000	8.8457	4.5461	0.0000	4.5461			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836	0.0000	3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**8.8457**	**1.6126**	**10.4582**	**4.5461**	**1.4836**	**6.0297**	**0.0000**	**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0652	0.0477	0.6202	1.7200e-003	0.2012	1.2000e-003	0.2024	0.0534	1.1000e-003	0.0545		173.3539	173.3539	4.8700e-003	4.6700e-003	174.8680
Total	**0.0652**	**0.0477**	**0.6202**	**1.7200e-003**	**0.2012**	**1.2000e-003**	**0.2024**	**0.0534**	**1.1000e-003**	**0.0545**		**173.3539**	**173.3539**	**4.8700e-003**	**4.6700e-003**	**174.8680**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656		2,872.0464	2,872.0464	0.9289		2,895.2684
Total	**1.9486**	**20.8551**	**15.2727**	**0.0297**	**7.0826**	**0.9409**	**8.0234**	**3.4247**	**0.8656**	**4.2903**		**2,872.0464**	**2,872.0464**	**0.9289**		**2,895.2684**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0543	0.0397	0.5169	1.4300e-003	0.1677	1.0000e-003	0.1687	0.0445	9.2000e-004	0.0454		144.4616	144.4616	4.0600e-003	3.8900e-003	145.7233
Total	**0.0543**	**0.0397**	**0.5169**	**1.4300e-003**	**0.1677**	**1.0000e-003**	**0.1687**	**0.0445**	**9.2000e-004**	**0.0454**		**144.4616**	**144.4616**	**4.0600e-003**	**3.8900e-003**	**145.7233**

3.3 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.1872	0.0000	3.1872	1.5411	0.0000	1.5411			0.0000			0.0000
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656	0.0000	2,872.0464	2,872.0464	0.9289		2,895.2684
Total	**1.9486**	**20.8551**	**15.2727**	**0.0297**	**3.1872**	**0.9409**	**4.1280**	**1.5411**	**0.8656**	**2.4067**	**0.0000**	**2,872.0464**	**2,872.0464**	**0.9289**		**2,895.2684**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0543	0.0397	0.5169	1.4300e-003	0.1677	1.0000e-003	0.1687	0.0445	9.2000e-004	0.0454		144.4616	144.4616	4.0600e-003	3.8900e-003	145.7233
Total	**0.0543**	**0.0397**	**0.5169**	**1.4300e-003**	**0.1677**	**1.0000e-003**	**0.1687**	**0.0445**	**9.2000e-004**	**0.0454**		**144.4616**	**144.4616**	**4.0600e-003**	**3.8900e-003**	**145.7233**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0913	2.4767	0.8429	9.7600e-003	0.3266	0.0249	0.3515	0.0940	0.0238	0.1178		1,049.4388	1,049.4388	0.0350	0.1523	1,095.6904
Worker	0.4673	0.3418	4.4450	0.0123	1.4419	8.6000e-003	1.4505	0.3824	7.9200e-003	0.3903		1,242.3693	1,242.3693	0.0349	0.0335	1,253.2207
Total	**0.5586**	**2.8185**	**5.2879**	**0.0221**	**1.7685**	**0.0335**	**1.8020**	**0.4764**	**0.0317**	**0.5082**		**2,291.8081**	**2,291.8081**	**0.0699**	**0.1858**	**2,348.9111**

3.4 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0913	2.4767	0.8429	9.7600e-003	0.3266	0.0249	0.3515	0.0940	0.0238	0.1178		1,049.4388	1,049.4388	0.0350	0.1523	1,095.6904
Worker	0.4673	0.3418	4.4450	0.0123	1.4419	8.6000e-003	1.4505	0.3824	7.9200e-003	0.3903		1,242.3693	1,242.3693	0.0349	0.0335	1,253.2207
Total	**0.5586**	**2.8185**	**5.2879**	**0.0221**	**1.7685**	**0.0335**	**1.8020**	**0.4764**	**0.0317**	**0.5082**		**2,291.8081**	**2,291.8081**	**0.0699**	**0.1858**	**2,348.9111**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0540	1.9431	0.7524	9.3000e-003	0.3266	0.0108	0.3374	0.0940	0.0104	0.1044		1,001.5653	1,001.5653	0.0335	0.1451	1,045.6477
Worker	0.4347	0.3022	4.0952	0.0119	1.4419	8.1000e-003	1.4500	0.3824	7.4500e-003	0.3899		1,202.4941	1,202.4941	0.0314	0.0309	1,212.4946
Total	**0.4887**	**2.2454**	**4.8475**	**0.0212**	**1.7685**	**0.0189**	**1.7874**	**0.4764**	**0.0178**	**0.4942**		**2,204.0594**	**2,204.0594**	**0.0648**	**0.1761**	**2,258.1423**

3.4 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0540	1.9431	0.7524	9.3000e-003	0.3266	0.0108	0.3374	0.0940	0.0104	0.1044		1,001.5653	1,001.5653	0.0335	0.1451	1,045.6477
Worker	0.4347	0.3022	4.0952	0.0119	1.4419	8.1000e-003	1.4500	0.3824	7.4500e-003	0.3899		1,202.4941	1,202.4941	0.0314	0.0309	1,212.4946
Total	**0.4887**	**2.2454**	**4.8475**	**0.0212**	**1.7685**	**0.0189**	**1.7874**	**0.4764**	**0.0178**	**0.4942**		**2,204.0594**	**2,204.0594**	**0.0648**	**0.1761**	**2,258.1423**

3.5 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694		2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.7048					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.7375**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**		**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0506	0.0351	0.4762	1.3800e-003	0.1677	9.4000e-004	0.1686	0.0445	8.7000e-004	0.0453		139.8249	139.8249	3.6500e-003	3.6000e-003	140.9878
Total	**0.0506**	**0.0351**	**0.4762**	**1.3800e-003**	**0.1677**	**9.4000e-004**	**0.1686**	**0.0445**	**8.7000e-004**	**0.0453**		**139.8249**	**139.8249**	**3.6500e-003**	**3.6000e-003**	**140.9878**

3.5 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694	0.0000	2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.7048					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.7375**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**	**0.0000**	**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0506	0.0351	0.4762	1.3800e-003	0.1677	9.4000e-004	0.1686	0.0445	8.7000e-004	0.0453		139.8249	139.8249	3.6500e-003	3.6000e-003	140.9878
Total	**0.0506**	**0.0351**	**0.4762**	**1.3800e-003**	**0.1677**	**9.4000e-004**	**0.1686**	**0.0445**	**8.7000e-004**	**0.0453**		**139.8249**	**139.8249**	**3.6500e-003**	**3.6000e-003**	**140.9878**

3.6 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	6.9622					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**7.1539**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0876	0.0609	0.8254	2.4000e-003	0.2906	1.6300e-003	0.2923	0.0771	1.5000e-003	0.0786		242.3632	242.3632	6.3200e-003	6.2300e-003	244.3788
Total	**0.0876**	**0.0609**	**0.8254**	**2.4000e-003**	**0.2906**	**1.6300e-003**	**0.2923**	**0.0771**	**1.5000e-003**	**0.0786**		**242.3632**	**242.3632**	**6.3200e-003**	**6.2300e-003**	**244.3788**

3.6 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day							lb/day			
Archit. Coating	6.9622					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**7.1539**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day							lb/day			
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0876	0.0609	0.8254	2.4000e-003	0.2906	1.6300e-003	0.2923	0.0771	1.5000e-003	0.0786		242.3632	242.3632	6.3200e-003	6.2300e-003	244.3788
Total	**0.0876**	**0.0609**	**0.8254**	**2.4000e-003**	**0.2906**	**1.6300e-003**	**0.2923**	**0.0771**	**1.5000e-003**	**0.0786**		**242.3632**	**242.3632**	**6.3200e-003**	**6.2300e-003**	**244.3788**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0565	0.2720	0.5119	1.7900e-003	0.1446	2.2600e-003	0.1469	0.0389	2.1400e-003	0.0411		185.7763	185.7763	8.4200e-003	0.0161	190.7953
Unmitigated	0.0565	0.2720	0.5119	1.7900e-003	0.1446	2.2600e-003	0.1469	0.0389	2.1400e-003	0.0411		185.7763	185.7763	8.4200e-003	0.0161	190.7953

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Automobile Care Center	50.00	50.00	50.00	66,975	66,975
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	50.00	50.00	50.00	66,975	66,975

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Automobile Care Center	16.60	8.40	6.90	33.00	48.00	19.00	21	51	28
Other Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Automobile Care Center	0.760000	0.000000	0.000000	0.000000	0.080000	0.080000	0.000000	0.080000	0.000000	0.000000	0.000000	0.000000	0.000000
Other Asphalt Surfaces	0.543376	0.059966	0.184357	0.131187	0.023843	0.006245	0.012012	0.009162	0.000826	0.000515	0.023898	0.000748	0.003864
Other Non-Asphalt Surfaces	0.543376	0.059966	0.184357	0.131187	0.023843	0.006245	0.012012	0.009162	0.000826	0.000515	0.023898	0.000748	0.003864

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	5.6800e-003	0.0517	0.0434	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003		62.0027	62.0027	1.1900e-003	1.1400e-003	62.3712
NaturalGas Unmitigated	5.6800e-003	0.0517	0.0434	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003		62.0027	62.0027	1.1900e-003	1.1400e-003	62.3712

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Automobile Care Center	527.023	5.6800e-003	0.0517	0.0434	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003		62.0027	62.0027	1.1900e-003	1.1400e-003	62.3712
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**5.6800e-003**	**0.0517**	**0.0434**	**3.1000e-004**		**3.9300e-003**	**3.9300e-003**		**3.9300e-003**	**3.9300e-003**		**62.0027**	**62.0027**	**1.1900e-003**	**1.1400e-003**	**62.3712**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Automobile Care Center	0.527023	5.6800e-003	0.0517	0.0434	3.1000e-004		3.9300e-003	3.9300e-003		3.9300e-003	3.9300e-003		62.0027	62.0027	1.1900e-003	1.1400e-003	62.3712
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**5.6800e-003**	**0.0517**	**0.0434**	**3.1000e-004**		**3.9300e-003**	**3.9300e-003**		**3.9300e-003**	**3.9300e-003**		**62.0027**	**62.0027**	**1.1900e-003**	**1.1400e-003**	**62.3712**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.2660	2.9000e-004	0.0315	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0675	0.0675	1.8000e-004		0.0719
Unmitigated	0.2660	2.9000e-004	0.0315	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0675	0.0675	1.8000e-004		0.0719

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0382					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2249					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9300e-003	2.9000e-004	0.0315	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0675	0.0675	1.8000e-004		0.0719
Total	**0.2660**	**2.9000e-004**	**0.0315**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.1000e-004**	**1.1000e-004**		**0.0675**	**0.0675**	**1.8000e-004**		**0.0719**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0382					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2249					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9300e-003	2.9000e-004	0.0315	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0675	0.0675	1.8000e-004		0.0719
Total	**0.2660**	**2.9000e-004**	**0.0315**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.1000e-004**	**1.1000e-004**		**0.0675**	**0.0675**	**1.8000e-004**		**0.0719**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B
Biological Resources Assessment

ELMT
CONSULTING

August 20, 2021

LILBURN CORPORATION
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SUBJECT: Habitat Assessment for the Proposed Truck Sales, Service/Repair and Parts Dealership Project Located in the City of San Bernardino, San Bernardino County, California

Introduction

This report contains the findings of ELMT Consulting's (ELMT) habitat assessment for the proposed Truck Sales, Service/Repair and Parts Dealership Project (project, project site) located in the City of San Bernardino, San Bernardino County, California. The habitat assessment was conducted by biologist Jacob H. Lloyd Davies on June 10, 2021 to document baseline conditions and assess the potential for special-status[1] plant and wildlife species to occur within the project site that could pose a constraint to implementation of the proposed project. Special attention was given to the suitability of the project site to support special-status plant and wildlife species identified by the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB), and other electronic databases as potentially occurring in the general vicinity of the project site.

Project Location

The project site is generally located south of State Route 210, north of Interstate 10, and east of Interstate 215 in the City of San Bernardino, San Bernardino County, California. The site is depicted on the San Bernardino South quadrangle of the United States Geological Survey's (USGS) 7.5-minute map series within Section 9 of Township 1 South, Range 4 West. Specifically, the site is located at 776 West Mill Street within Assessor Parcel Numbers 0136-151-06, -09, -11, -19, and 0136-142-02. Refer to Exhibits 1-3 in Attachment A.

Project Description

The project proposed the grading for, and construction of, a truck sales, service/repair, and parts sales dealership (refer to Attachment B, *Site Plan*).

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[1] As used in this report, "special-status" refers to plant and wildlife species that are federally and State listed, proposed, or candidates; plant species that have been designated with a California Native Plant Society Rare Plant Rank; wildlife species that are designated by the CDFW as fully protected, species of special concern, or watch list species; and specially protected natural vegetation communities as designated by the CDFW.

Methodology

A literature review and records search were conducted to determine which special-status biological resources have the potential to occur on or within the general vicinity of the project site. In addition to the literature review, a general habitat assessment or field investigation of the project site was conducted to document existing conditions and assess the potential for special-status biological resources to occur within the project site.

Literature Review

Prior to conducting the field investigation, a literature review and records search was conducted for special-status biological resources potentially occurring on or within the vicinity of the project site. Previously recorded occurrences of special-status plant and wildlife species and their proximity to the project site were determined through a query of the CDFW's QuickView Tool in the Biogeographic Information and Observation System (BIOS), CNDDB Rarefind 5, the California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California, Calflora Database, compendia of special-status species published by CDFW, and the United States Fish and Wildlife Service (USFWS) species listings.

All available reports, survey results, and literature detailing the biological resources previously observed on or within the vicinity of the project site were reviewed to understand existing site conditions and note the extent of any disturbances that have occurred within the project site that would otherwise limit the distribution of special-status biological resources. Standard field guides and texts were reviewed for specific habitat requirements of special-status and non-special-status biological resources, as well as the following resources:

- Google Earth Pro historic aerial imagery (1994-2018);
- United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), Soil Survey[2];
- USFWS Critical Habitat designations for Threatened and Endangered Species; and
- USFWS Endangered Species Profiles.

The literature review provided a baseline from which to inventory the biological resources potentially occurring within the project site. The CNDDB database was used, in conjunction with ArcGIS software, to locate the nearest recorded occurrences of special-status species and determine the distance from the project site.

Habitat Assessment/Field Investigation

Following the literature review, biologist Jacob H. Lloyd Davies inventoried and evaluated the condition of the habitat within a 200-foot buffer around the project site, where applicable, on June 10, 2021. Plant communities and land cover types identified on aerial photographs during the literature review were verified by walking meandering transects throughout the project site. In addition, aerial photography was reviewed

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[2] A soil series is defined as a group of soils with similar profiles developed from similar parent materials under comparable climatic and vegetation conditions. These profiles include major horizons with similar thickness, arrangement, and other important characteristics, which may promote favorable conditions for certain biological resources.

prior to the site investigation to locate potential natural corridors and linkages that may support the movement of wildlife through the area. These areas identified on aerial photography were then walked during the field investigation.

Soil Series Assessment

On-site and adjoining soils were researched prior to the field investigation using the USDA NRCS Soil Survey for San Bernardino County, California. In addition, a review of the local geological conditions and historical aerial photographs was conducted to assess the ecological changes that the project site has undergone.

Plant Communities

Plant communities were mapped using 7.5-minute USGS topographic base maps and aerial photography. The plant communities were classified in accordance with Sawyer, Keeler-Wolf and Evens (2009), delineated on an aerial photograph, and then digitized into GIS Arcview. The Arcview application was used to compute the area of each plant community and/or land cover type in acres.

Plants

Common plant species observed during the field investigation were identified by visual characteristics and morphology in the field and recorded in a field notebook. Unusual and less-familiar plants were photographed in the field and identified in the laboratory using taxonomic guides. Taxonomic nomenclature used in this study follows the 2012 Jepson Manual (Hickman 2012). In this report, scientific names are provided immediately following common names of plant species (first reference only).

Wildlife

Wildlife species detected during the field investigation by sight, calls, tracks, scat, or other sign were recorded during surveys in a field notebook. Field guides used to assist with identification of wildlife species during the survey included The Sibley Field Guide to the Birds of Western North America (Sibley 2003), A Field Guide to Western Reptiles and Amphibians (Stebbins 2003), and A Field Guide to Mammals of North America (Reid 2006). Although common names of wildlife species are well standardized, scientific names are provided immediately following common names in this report (first reference only).

Jurisdictional Drainages and Wetlands

Aerial photography was reviewed prior to conducting a field investigation in order to locate and inspect any potential natural drainage features, ponded areas, or water bodies that may fall under the jurisdiction of the United States Army Corps of Engineers (Corps), Regional Water Quality Control Board (Regional Board), or CDFW. In general, surface drainage features indicated as blue-line streams on USGS maps that are observed or expected to exhibit evidence of flow are considered potential riparian/riverine habitat and are also subject to state and federal regulatory jurisdiction. In addition, ELMT reviewed jurisdictional waters information through examining historical aerial photographs to gain an understanding of the impact of land-use on natural drainage patterns in the area. The USFWS National Wetland Inventory (NWI) and Environmental Protection Agency (EPA) Water Program "My Waters" data layers were also reviewed to determine whether any hydrologic features and wetland areas have been documented on or within the vicinity of the project site.

Existing Site Conditions

The proposed project site is located in a heavily developed area in the City of San Bernardino. Surrounding land uses include industrial, commercial, institutional, and residential development in all directions with scattered undeveloped parcels throughout. The site is bordered by Interstate 215 to the west, Lytle Creek (a concrete lined flood control channel) to the east, an automotive repair and maintenance center to the southeast, and West Mill Street to the south. In addition, two radio towers occur adjacent to the eastern boundary. The site itself is undeveloped.

Topography and Soils

Elevation ranges from approximately 1,016 to 1,027 feet above mean sea level and generally slopes from northwest to southeast. The western boundary of the project site consists of a small slope that extends to the west up to the northbound Interstate 15 freeway onramp. Based on the NRCS USDA Web Soil Survey, the project site is historically underlain by Tujunga gravelly loamy sand (0 to 9 percent slopes). Refer to Exhibit 4, *Soils*, in Attachment A. Soils on-site have been compacted by anthropogenic disturbances such as routine weed abatement, illegal camping and dumping, and surrounding development.

Vegetation

Due to historic and existing land uses and surrounding development, no native plant communities or natural communities of special concern were observed within the project footprint. Refer to Attachment C, *Site Photographs*, for representative site photographs. The project site supports one (1) land cover type that would be classified as disturbed (refer to Exhibit 5, *Vegetation*, in Attachment A).

The disturbed area onsite is composed primarily of non-native early successional/ruderal plant species. The disturbed areas onsite have been subject to routine anthropogenic disturbance associated with routine weed abatement and surrounding development. Plant species found within the disturbed areas on-site were dominated non-native grasses such as bromes (*Bromus* sp.) and oats (*Avena* sp.). Common plant species observed onsite include Russian thistle (*Salsola tragus*), lambs quarters (*Chenopodium album*), Mediterranean mustard (*Hirschfeldia incana*), prickly lettuce (*Lactuca serriola*), telegraph weed (*Heterotheca grandiflora*), red-stemmed filaree (*Erodium cicutarum*), California croton (*Croton californica*), ragweed (*Ambrosia psilostachya*), jimsonweed (*Datura wrightii*), deerweed (*Acmispon glaber*), California buckwheat (*Eriogonum fasciculatum*), spurge (*Euphorbia* sp.), Mexican fan palm (*Washingtonia robusta*), and puncturevine (*Tribulus terrestris*). In addition, the remnant swale supports a small stand of large shrubs and trees composed of cottonwood (*Populus fremontii*), salt cedar (*Tamarix* sp.), mulefat (*Baccharis salicifolia*), and oleander (*Nerium oleander*).

Wildlife

Plant communities provide foraging habitat, nesting/denning sites, and shelter from adverse weather or predation. This section provides a discussion of those wildlife species that were observed or are expected to occur within the project site. The discussion is to be used a general reference and is limited by the season, time of day, and weather conditions in which the field investigation was conducted. Wildlife detections were based on calls, songs, scat, tracks, burrows, and direct observation. The project site provides limited habitat for wildlife species except those adapted to a high degree of anthropogenic disturbances and development.

Fish

No fish or hydrogeomorphic features (e.g., perennial creeks, ponds, lakes, reservoirs) that would provide suitable habitat for fish were observed on or within the vicinity of the project site. Therefore, no fish are expected to occur and are presumed absent from the project site.

Amphibians

No amphibians or hydrogeomorphic features (e.g., perennial creeks, ponds, lakes, reservoirs) that would provide suitable habitat for amphibian species were observed on or within the vicinity of the project site. Therefore, no amphibians are expected to occur on the project site and are presumed absent.

Reptiles

The survey area provides marginal habitat for local reptile species adapted to routine disturbance and development. The only reptilian species observed was Great Basin fence lizard (*Sceloporus occidentalis longipes*). Additional common reptilian species that could potential occur on-site include western side-blotched lizard (*Uta stansburiana elegans*) and San Diego alligator lizard (*Elgaria multicarinata webbii*).

Birds

The project site provides marginal foraging and nesting habitat for bird species adapted to routine disturbance and development. Bird species detected during the field investigation include house finch (*Haemorhous mexicanus*), killdeer (*Charadrius vociferus*), common raven (*Corvus corax*), and cliff swallow (*Petrochelidon pyrrhonota*).

Mammals

The survey area provides marginal foraging and cover habitat for mammalian species adapted to routine disturbance and development. Mammalian species detected during the field investigation include feral domestic cat (*Felis catus*). Common mammalian species that could be expected to occur include pocket gopher (*Thomomys bottae*), coyote (*Canis latrans*), possum (*Didelphis virginiana*), and raccoon (*Procyon lotor*). Due to the nature and frequency of routine anthropogenic disturbances associated with adjacent roadways and development, no bats species are expected to occur onsite.

Nesting Birds

No active nests or birds displaying nesting behavior were observed during the field survey, which was conducted during breeding season. Although subjected to routine disturbance, the ornamental vegetation found on-site has the potential to provide suitable nesting habitat for year-round and seasonal avian residents, as well as migrating songbirds that could occur in the area that area adapted to urban environments. (*Charadrius vociferans*). No raptors are expected to nest on-site due to lack of suitable nesting opportunities.

Nesting birds are protected pursuant to the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (Sections 3503, 3503.5, 3511, and 3513 prohibit the take, possession, or destruction of birds, their nests or eggs). If construction occurs between February 1st and August 31st, a pre-construction clearance survey for nesting birds should be conducted within three (3) days of the start of any vegetation removal or ground disturbing activities to ensure that no nesting birds will be disturbed during construction.

Migratory Corridors and Linkages

Habitat linkages provide connections between larger habitat areas that are separated by development. Wildlife corridors are similar to linkages but provide specific opportunities for animals to disperse or migrate between areas. A corridor can be defined as a linear landscape feature of sufficient width to allow animal movement between two comparatively undisturbed habitat fragments. Adequate cover is essential for a corridor to function as a wildlife movement area. It is possible for a habitat corridor to be adequate for one species yet still inadequate for others. Wildlife corridors are features that allow for the dispersal, seasonal migration, breeding, and foraging of a variety of wildlife species. Additionally, open space can provide a buffer against both human disturbance and natural fluctuations in resources.

According to the San Bernardino County General Plan, the project site has not been identified as occurring within a Wildlife Corridor or Linkage. As designated by the San Bernardino County General Plan Open Space Element, major open space areas documented in the vicinity of the project site include the Santa Ana River, located approximately 1.5 miles to the southeast, and the Lytle Creek Wash, located approximately 2.3 miles to the northwest.

The proposed project will be confined to existing areas that have been heavily disturbed and are isolated from regional wildlife corridors and linkages. In addition, there are no riparian corridors, creeks, or useful patches of steppingstone habitat (natural areas) within or connecting the site to a recognized wildlife corridor or linkage. As such, implementation of the proposed project is not expected to impact wildlife movement opportunities. Therefore, impacts to wildlife corridors or linkages are not expected to occur.

Jurisdictional Areas

There are three key agencies that regulate activities within inland streams, wetlands, and riparian areas in California. The Corps Regulatory Branch regulates discharge of dredge or fill materials into “waters of the United States” pursuant to Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. Of the State agencies, the CDFW regulates alterations to streambed and bank under Fish and Wildlife Code Sections 1600 et seq., and the Regional Board regulates discharges into surface waters pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act.

The USFWS NWI and the USGS National Hydrography Dataset were reviewed to determine if any blueline streams or riverine resources have been documented within or immediately surrounding the project site. Based on this review, no riverine resources were identified on the project site. It should be noted that one (1) riverine resource was identified adjacent to the eastern boundary of the site, outside of the project footprint, associated with the channelized portion of Lytle Creek. No drainage features were observed on-site during the field investigations. Project activities are not expected to encroach into the Lytle Creek Channel; and therefore, development of the project will not result in impacts to Corps, Regional Board, or CDFW jurisdiction and regulatory approvals will not be required.

Special-Status Biological Resources

The CNDDB Rarefind 5 and the CNPS Electronic Inventory of Rare and Endangered Vascular Plants of California were queried for reported locations of special-status plant and wildlife species as well as special-status natural plant communities in the San Bernardino South USGS 7.5-minute quadrangle. Only one quadrangle was used due the proximity of the site to quadrangle boundaries, geographical similarities with adjacent quadrangles, and surrounding development. The habitat assessment evaluated the conditions of the habitat(s) within the boundaries of the project site to determine if the existing plant communities, at the time of the survey, have the potential to provide suitable habitat(s) for special-status plant and wildlife species.

The literature search identified twenty-five (25) special-status plant species, sixty-six (66) special-status wildlife species, and three (3) special-status plant communities as having potential to occur within the San Bernardino South USGS 7.5-minute quadrangle. Special-status plant and wildlife species were evaluated for their potential to occur within the project site based on habitat requirements, availability and quality of suitable habitat, and known distributions. Species determined to have the potential to occur within the general vicinity of the project site is presented in Attachment D*: Potentially Occurring Special-Status Biological Resources*.

Special-Status Plants

According to the CNDDB and CNPS, twenty-five (25) special-status plant species have been recorded in the San Bernardino South quadrangles (refer to Attachment D). No special-status plant species were observed on-site during the habitat assessment. The project site has been subject to anthropogenic disturbances from routine weed abatement, illegal camping and dumping, and surrounding development. These disturbances have reduced the suitability of the habitat to support special-status plant species known to occur in the general vicinity of the project site. Based on habitat requirements for specific special-status plant species and the availability and quality of habitats needed by each species, it was determined that the project site does not provide suitable habitat for any of the special-status plant species known to occur in the area and all are presumed to be absent from the project site. No focused surveys are recommended.

Special-Status Wildlife

According to the CNDDB, sixty-six (66) special-status wildlife species have been reported in the San Bernardino South quadrangle (refer to Attachment D). No special-status wildlife species were observed on-site during the habitat assessment. The project site and surrounding area have been subject to a variety of anthropogenic disturbances from routine weed abatement, illegal camping and dumping, and existing surrounding development. These disturbances have eliminated the natural plant communities that once occurred onsite which has reduced potential foraging and nesting/denning opportunities for wildlife species.

Based on habitat requirements for specific species and the availability and quality of onsite habitats, it was determined that the proposed project site has a low potential to provide minimal foraging habitat for Cooper's hawk (*Accipiter cooperii*). Further, it was determined that the project site does not provide suitable habitat for any of the other special-status wildlife species known to occur in the area since the project site has been heavily disturbed from surrounding development.

Cooper's hawk is neither federally or state listed as endangered or threatened. In order to ensure impacts to

Cooper's hawk do not occur from implementation of the proposed project, a pre-construction nesting bird clearance survey shall be conducted prior to ground disturbance. With implementation of the pre-construction nesting bird clearance survey, impacts to Cooper's hawk will be less than significant and no mitigation will be required.

Based on regional significance, the potential occurrence of burrowing owl (*Athene cunicularia*) is described in further detail below.

Burrowing Owl

The burrowing owl is currently listed as a California Species of Special Concern. It is a grassland specialist distributed throughout western North America where it occupies open areas with short vegetation and bare ground within shrub, desert, and grassland environments. Burrowing owls use a wide variety of arid and semi-arid environments with well-drained, level to gently-sloping areas characterized by sparse vegetation and bare ground (Haug and Didiuk 1993; Dechant et al. 1999). Burrowing owls are dependent upon the presence of burrowing mammals (such as ground squirrels) whose burrows are used for roosting and nesting (Haug and Didiuk 1993). The presence or absence of colonial mammal burrows is often a major factor that limits the presence or absence of burrowing owls. Where mammal burrows are scarce, burrowing owls have been found occupying man-made cavities, such as buried and non-functioning drain pipes, stand-pipes, and dry culverts. Burrowing mammals may burrow beneath rocks and debris or large, heavy objects such as abandoned cars, concrete blocks, or concrete pads. They also require open vegetation allowing line-of-sight observation of the surrounding habitat to forage as well as watch for predators.

No burrowing owls or recent sign (i.e., pellets, feathers, castings, or whitewash) was observed during the field investigation. Portions of the project site are unvegetated and/or vegetated with a variety of low-growing plant species that allow for line-of-sight observation favored by burrowing owls. However, the project site lacks suitable burrows (>4 inches in diameter) capable of providing roosting and nesting opportunities. In addition, the site is bordered by electrical towers and power lines which decrease the likelihood that burrowing owls would occur on the project site as these features provide perching opportunities for larger raptor species (i.e., red-tailed hawk [*Buteo jamaicensis*]) that prey on burrowing owls. Burrowing owl is further precluded from the site due to the presence of illegal camping and an associated colony of feral domestic cats. Therefore, it was determined that the project site does not have potential to provide suitable habitat for burrowing owls and focused surveys are not recommended.

Special-Status Plant Communities

According to the CNDDB, three (3) special-status plant communities have been reported in the San Bernardino South USGS 7.5-minute quadrangle: Riversidian Alluvial Fan Sage Scrub, Southern Cottonwood Willow Riparian Forest, and Southern Riparian Scrub. Based on the results of the field investigation, no special-status plant communities were observed onsite. Therefore, no special-status plant communities will be impacted by project implementation.

Critical Habitats

Under the federal Endangered Species Act, "Critical Habitat" is designated at the time of listing of a species or within one year of listing. Critical Habitat refers to specific areas within the geographical range of a species at the time it is listed that include the physical or biological features that are essential to the survival and eventual recovery of that species. Maintenance of these physical and biological features requires special management considerations or protection, regardless of whether individuals or the species are present or not. All federal agencies are required to consult with the USFWS regarding activities they authorize, fund, or permit which may affect a federally listed species or its designated Critical Habitat. The purpose of the consultation is to ensure that projects will not jeopardize the continued existence of the listed species or adversely modify or destroy its designated Critical Habitat. The designation of Critical Habitat does not affect private landowners, unless a project they are proposing is on federal lands, uses federal funds, or requires federal authorization or permits (e.g., funding from the Federal Highways Administration or a Clean Water Act Permit from the United States Army Corps of Engineers). If a there is a federal nexus, then the federal agency that is responsible for providing the funding or permit would consult with the USFWS.

The project site is not located within federally designated Critical Habitat. Further, the closest Critical Habitat designations are located approximately 1.2 miles southeast of the site for southwestern willow flycatcher (*Empidonax traillii extimus*) and approximately 1.75 miles northwest of the site for San Bernardino kangaroo rat (*Dipodomys merriami parvus*) (Exhibit 6, *Critical Habitat*). Therefore, no impacts to federally designated Critical Habitat will occur from implementation of the proposed project.

Conclusion

Based literature review and field survey, and existing site conditions discussed in this report, implementation of the project will have no significant impacts on federally or State listed species known to occur in the general vicinity of the project site. Additionally, the project will have no effect on designated Critical Habitat or regional wildlife corridors/linkage because none exists within the area. No jurisdictional drainage and/or wetland features were observed on the project site during the field investigation. No further surveys are recommended. With completion of the recommendations provided below, no impacts to year-round, seasonal, or special-status avian residents or special-status species will occur from implementation of the proposed project.

Recommendations

Migratory Bird Treaty Act and Fish and Game Code

Nesting birds are protected pursuant to the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (Sections 3503, 3503.5, 3511, and 3513 prohibit the take, possession, or destruction of birds, their nests or eggs). In order to protect migratory bird species, a nesting bird clearance survey should be conducted prior to any ground disturbance or vegetation removal activities that may disrupt the birds during the nesting season.

If construction occurs between February 1st and August 31st, a pre-construction clearance survey for nesting birds should be conducted within three (3) days of the start of any vegetation removal or ground disturbing activities to ensure that no nesting birds will be disturbed during construction. The biologist conducting the clearance survey should document a negative survey with a brief letter report indicating that no impacts to active avian nests will occur. If an active avian nest is discovered during the pre-construction clearance survey, construction activities should stay outside of a no-disturbance buffer. The size of the no-disturbance buffer will be determined by the wildlife biologist and will depend on the level of noise and/or surrounding anthropogenic disturbances, line of sight between the nest and the construction activity, type and duration of construction activity, ambient noise, species habituation, and topographical barriers. These factors will be evaluated on a case-by-case basis when developing buffer distances. Limits of construction to avoid an active nest will be established in the field with flagging, fencing, or other appropriate barriers; and construction personnel will be instructed on the sensitivity of nest areas. A biological monitor should be present to delineate the boundaries of the buffer area and to monitor the active nest to ensure that nesting behavior is not adversely affected by the construction activity. Once the young have fledged and left the nest, or the nest otherwise becomes inactive under natural conditions, construction activities within the buffer area can occur.

Please do not hesitate to contact Tom McGill at (951) 285-6014 or tmcgill@elmtconsulting.com or Travis McGill at (909) 816-1646 or travismcgill@elmtconsulting.com should you have any questions this report.

Sincerely,

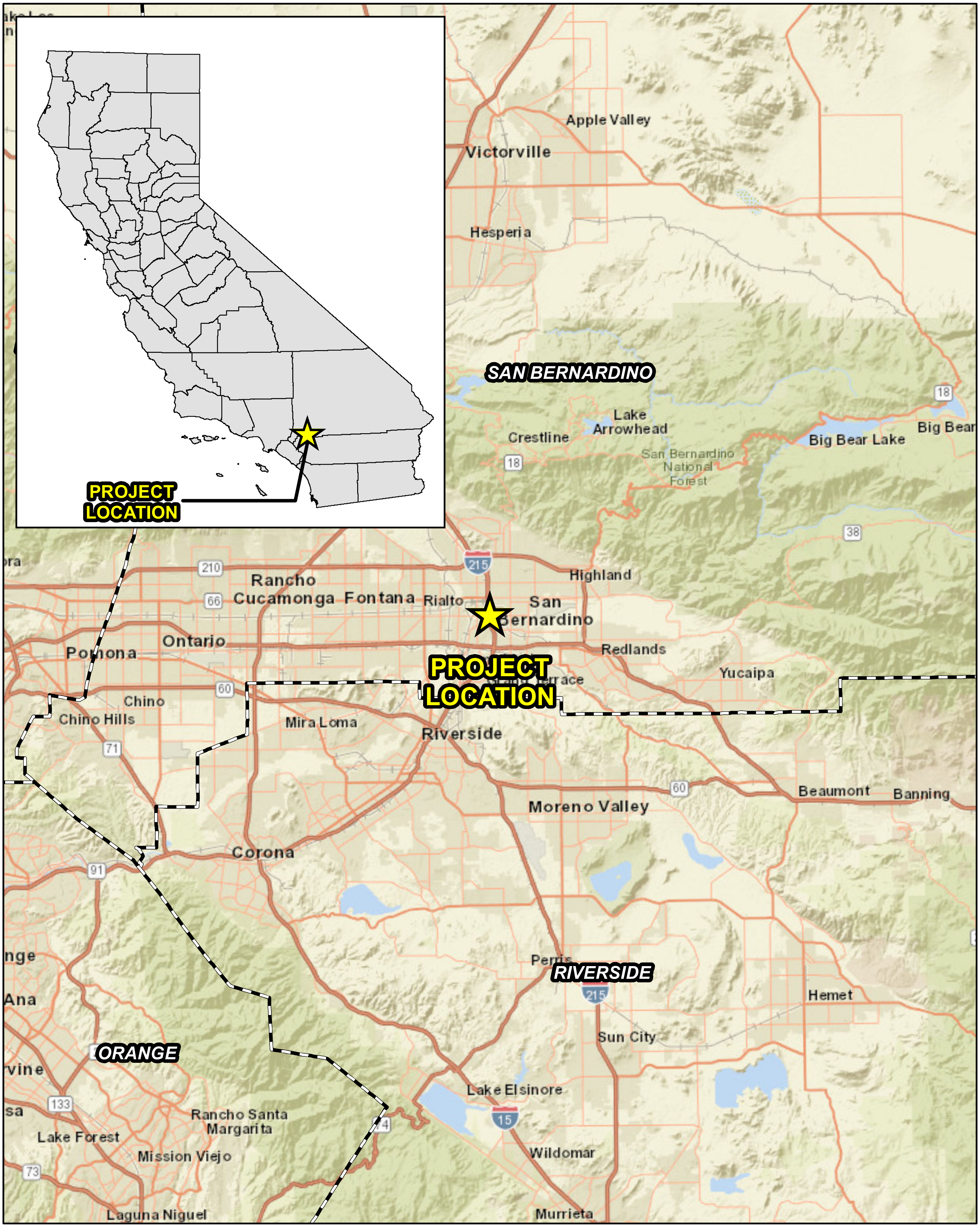
Thomas J. McGill, Ph.D. Managing Director	Travis J. McGill Director

Attachments:

A. *Project Exhibits*
B. *Site Plan*
C. *Site Photographs*
D. *Potentially Occurring Special-Status Biological Resources*
E. *Regulations*

Attachment A

Project Exhibits



TRUCK SALES, SERVICE/REPAIR AND PARTS DEALERSHIP
HABITAT AND JURISDICTIONAL ASSESSMENT

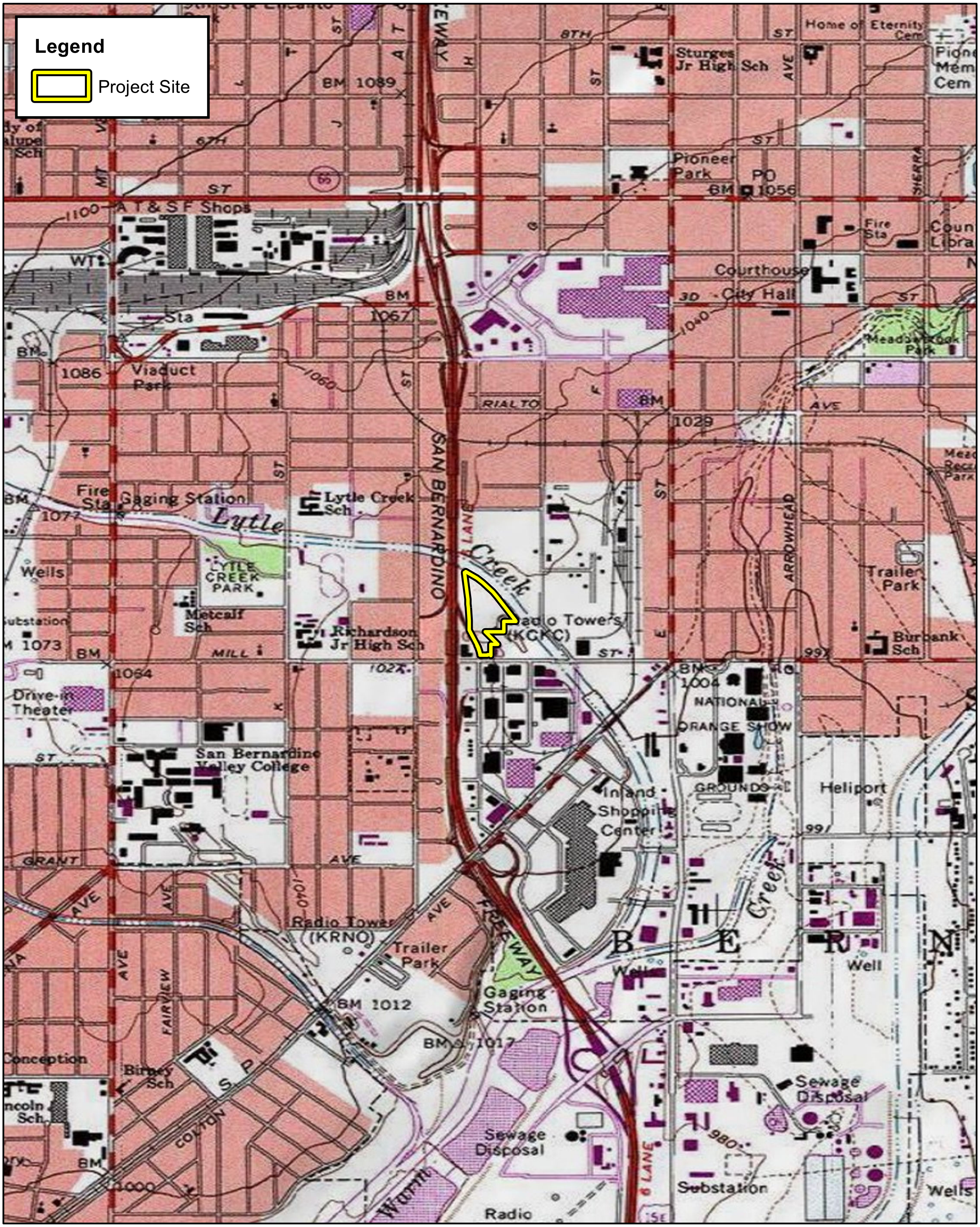
Regional Vicinity

Exhibit 1

ELMT CONSULTING

0 2.5 5 10 Miles

Source: World Street Map, San Bernardino County



TRUCK SALES, SERVICE/REPAIR AND PARTS DEALERSHIP
HABITAT AND JURISDICTIONAL ASSESSMENT

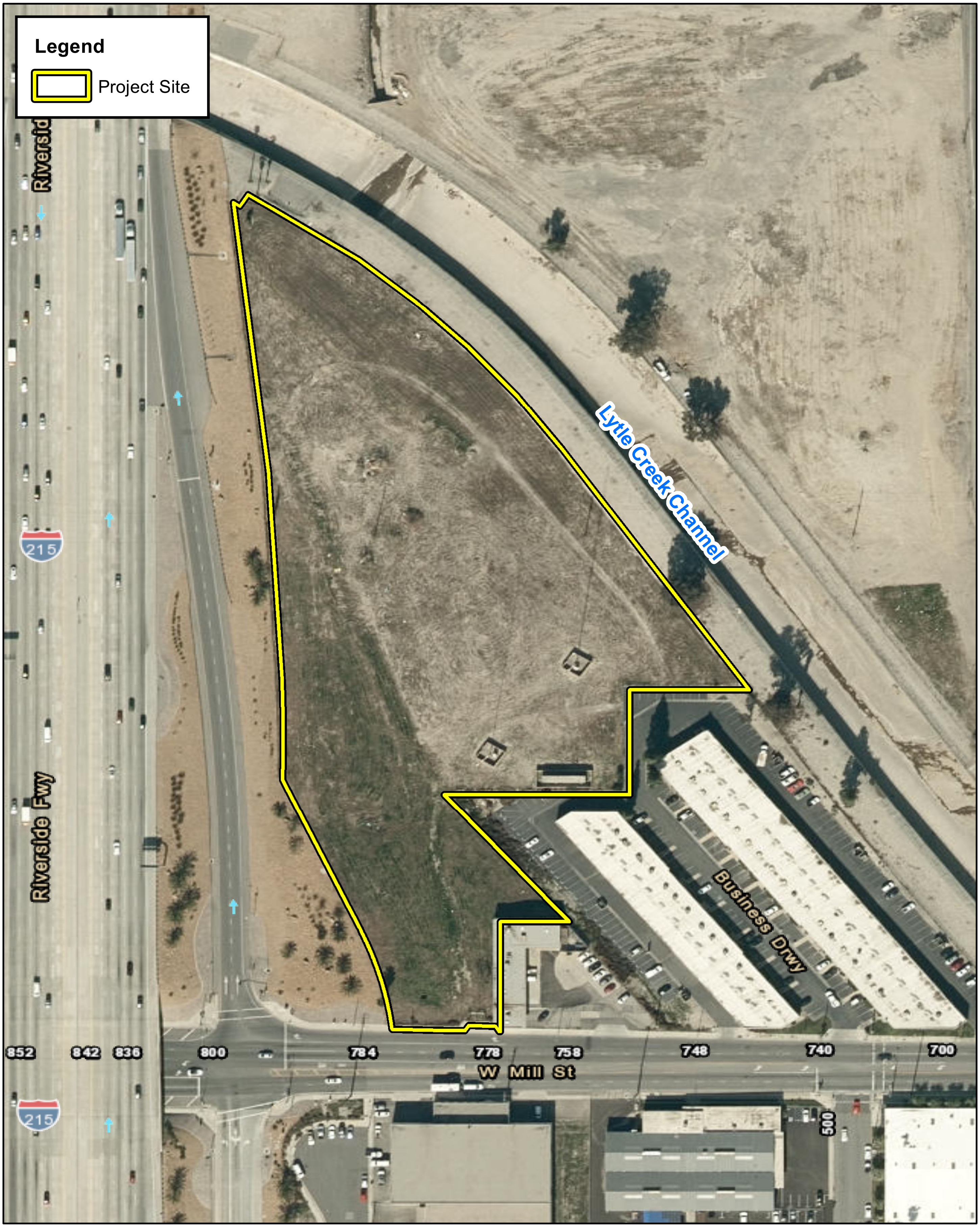
Site Vicinity

Exhibit 2

ELMT CONSULTING

0 1,000 2,000 4,000 Feet

Source: USA Topographic Map, San Bernardino County



TRUCK SALES, SERVICE/REPAIR AND PARTS DEALERSHIP
HABITAT AND JURISDICTIONAL ASSESSMENT

Project Site

Exhibit 3

ELMT CONSULTING

0 62.5 125 250
Feet

Source: ESRI Aerial Imagery, San Bernardino County

ELMT CONSULTING

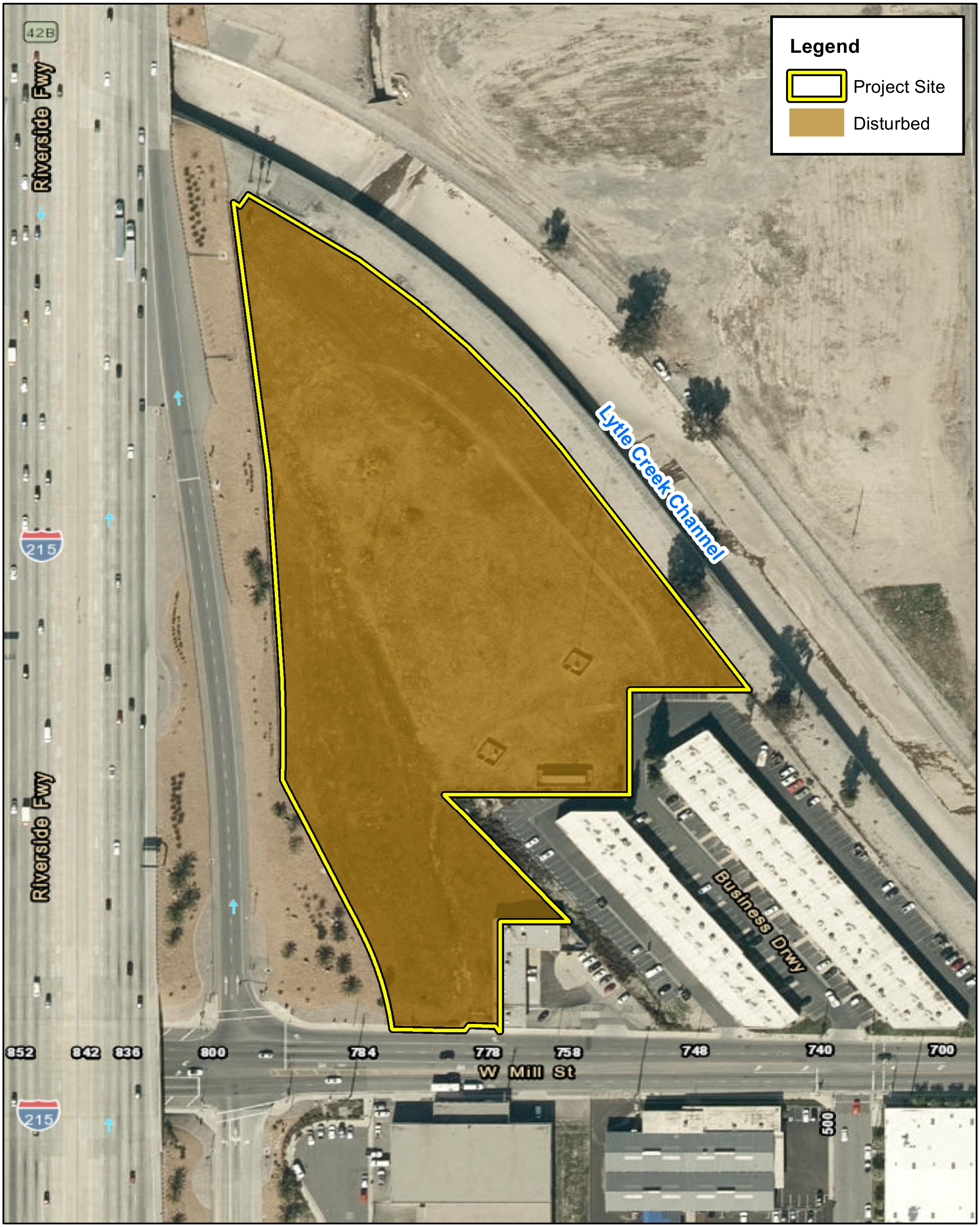
0 62.5 125 250 Feet

TRUCK SALES, SERVICE/REPAIR AND PARTS DEALERSHIP
HABITAT AND JURISDICTIONAL ASSESSMENT

Soils

Exhibit 4

Source: ESRI Aerial Imagery, Soil Survey Geographic Database, San Bernardino County



TRUCK SALES, SERVICE/REPAIR AND PARTS DEALERSHIP
HABITAT AND JURISDICTIONAL ASSESSMENT

Vegetation

Exhibit 5

Source: ESRI Aerial Imagery, San Bernardino County

ELMT CONSULTING

0 0.5 1 2 Miles

Source: ESRI Aerial Imagery, USFWS Critical Habitat, San Bernardino County

TRUCK SALES, SERVICE/REPAIR AND PARTS DEALERSHIP
HABITAT AND JURISDICTIONAL ASSESSMENT

Critical Habitat

Exhibit 6

Attachment B

Site Plans

PRELIMINARY GRADING PLAN
776 W MILL STREET
IN THE CITY OF SAN BERNARDINO, CALIFORNIA

FLOOD ZONE NOTE:

NATIONAL FLOOD INSURANCE PROGRAM

PER FEMA FIRM PANEL NO. 06071C8681J, & 06071C8683J (EFFECTIVE DATE – SEPTEMBER 2, 2016), THE PROJECT SITE IS LOCATED WITHIN SHADED ZONE X ("AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM THE 1% ANNUAL CHANCE FLOOD").

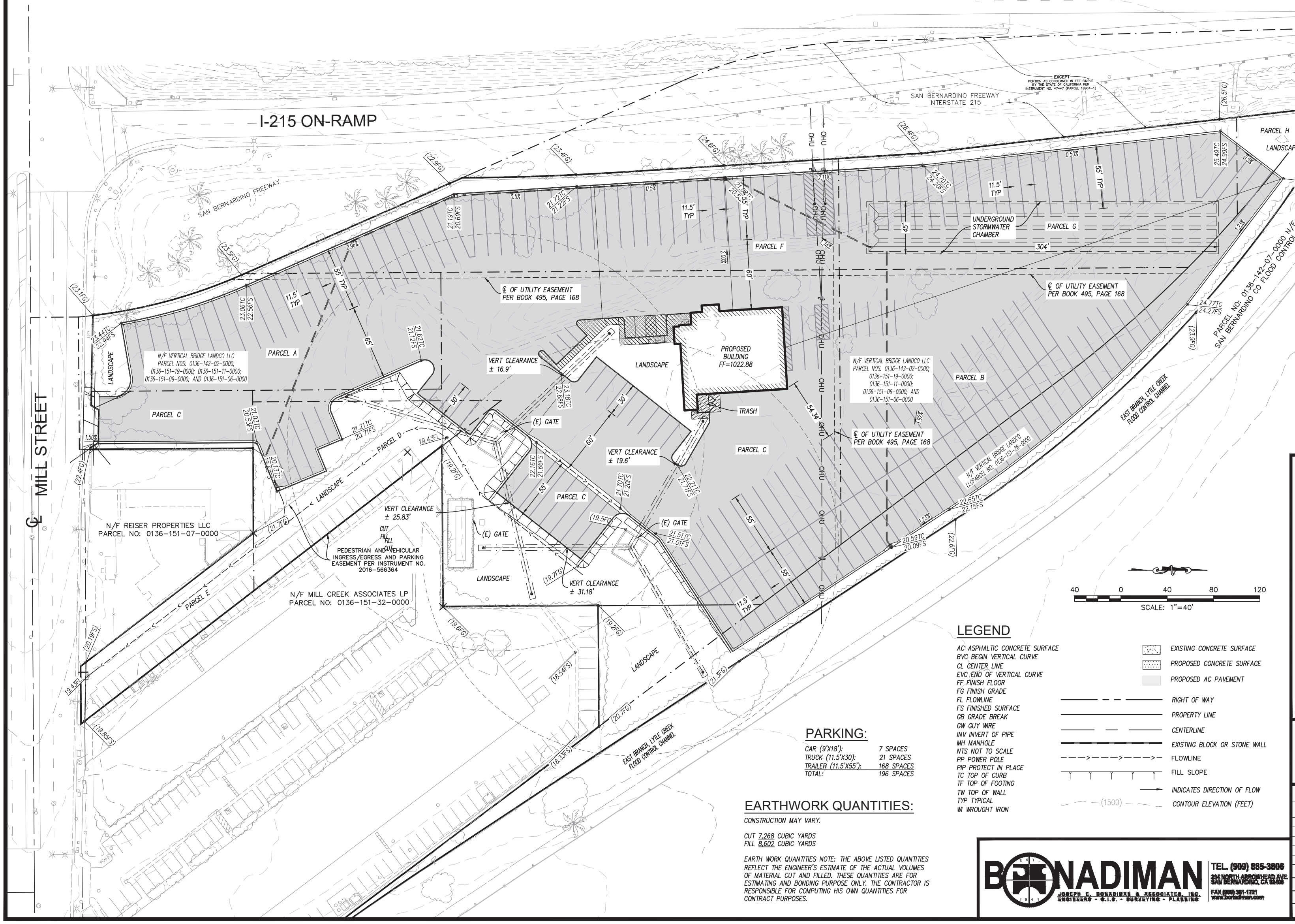
BUILDING SETBACK:

FRONT:	10'
REAR:	0'
SIDE:	0'
HEIGHT:	30'
LOT COVERAGE:	50%

DATA DERIVED FROM CITY OF SAN BERNARDINO DEVELOPMENT CODE 19.06.030 TABLE 06.02.

PARCEL COVERAGE:

SUBJECT	EXISTING	%	PROPOSED	%
BUILDING	0 SF.	0%	5,950 SF.	2.0%
HARDSCAPE	0 SF.	0%	234,445 SF.	76.0%
LANDSCAPE/NATIVE	308,319 SF.	100%	67,924 SF.	22.0%
TOTALS			308,319 SF.	100% (7.08 AC.)

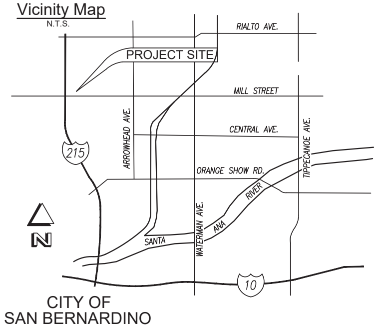


PROJECT INFORMATION

ASSESSOR'S PARCEL NO:	0136-151-06, 09, 11, 19 & 0136-142-02
GROSS ACREAGE:	308,316 SF / 7.08 AC
APPROX. TOTAL NET:	308,319 SF / 7.08 AC
EXISTING ZONING:	CCS-1, CENTRAL CITY SOUTH
PROPOSED ZONING:	CCS-1, CENTRAL CITY SOUTH
EXISTING LAND USE:	VACANT
PROPOSED LAND USE:	TRUCKING & TRAILER SALES
CABLE	AT&T (800) 331-0500
WATER PURVEYOR:	CITY OF SAN BERNARDINO (909) 383-5381
SEWER PURVEYOR:	CITY OF SAN BERNARDINO (909) 383-5381
GAS PURVEYOR:	SOUTHERN CALIFORNIA GAS CO. (909) 335-7793
ELECTRICITY PURVEYOR:	SOUTHERN CALIFORNIA EDISON (909) 793-2061
TELEPHONE PURVEYOR:	GENERAL TELEPHONE (909) 797-8277

Vicinity Map

N.T.S.



LEGEND

AC ASPHALTIC CONCRETE SURFACE
BVC BEGIN VERTICAL CURVE
CL CENTER LINE
EVC END OF VERTICAL CURVE
FF FINISH FLOOR
FG FINISH GRADE
FL FLOWLINE
FS FINISHED SURFACE
GB GRADE BREAK
GW GUY WIRE
INV INVERT OF PIPE
MH MANHOLE
NTS NOT TO SCALE
PP POWER POLE
PIP PROTECT IN PLACE
TC TOP OF CURB
TF TOP OF FOOTING
TW TOP OF WALL
TYP TYPICAL
WI WROUGHT IRON

EXISTING CONCRETE SURFACE
PROPOSED CONCRETE SURFACE
PROPOSED AC PAVEMENT
RIGHT OF WAY
PROPERTY LINE
CENTERLINE
EXISTING BLOCK OR STONE WALL
——>——>——>— FLOWLINE
FILL SLOPE
→ INDICATES DIRECTION OF FLOW
— (1500) — CONTOUR ELEVATION (FEET)

PARKING:

CAR (9'X18'):	7 SPACES
TRUCK (11.5'X30):	21 SPACES
TRAILER (11.5'X55'):	168 SPACES
TOTAL:	196 SPACES

EARTHWORK QUANTITIES:

CONSTRUCTION MAY VARY.

CUT 7,268 CUBIC YARDS
FILL 8,602 CUBIC YARDS

EARTH WORK QUANTITIES NOTE: THE ABOVE LISTED QUANTITIES REFLECT THE ENGINEER'S ESTIMATE OF THE ACTUAL VOLUMES OF MATERIAL CUT AND FILLED. THESE QUANTITIES ARE FOR ESTIMATING AND BONDING PURPOSE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR COMPUTING HIS OWN QUANTITIES FOR CONTRACT PURPOSES.

BONADIMAN
EST. 1941
JOSEPH E. BONADIMAN & ASSOCIATES, INC.
ENGINEERS • G.I.S. • SURVEYING • PLANNING
TEL. (909) 885-3806
234 NORTH ARROWHEAD AVE.
SAN BERNARDINO, CA 92408
FAX (909) 381-1721
www.bonadiman.com

PRELIMINARY GRADING PLAN
776 W MILL STREET
CITY OF SAN BERNARDINO, CA 92408
APN: 0136-151-06, 09, 11, 19 & 0136-142-02

REVISIONS

NO	DESCRIPTION	BY	APPROVED	DATE

PREPARED FOR: TEC DEVELOPMENT

DRAWN BY:	JTS	SCALE:	1" = 40'	SHEET: 1 OF 1		SP1
CHECKED BY:	JTS	JOB NO:	204828			
DISREGARD PRINTS BEARING EARLIER REVISION DATES ➡		05-24-21				

Attachment C

Site Photographs

Photograph 1: From the northwest corner of the project site looking southeast along the eastern boundary.

Photograph 2: From the northwest corner of the project site looking south along the western boundary.

Photograph 3: From the middle of the eastern boundary of the project site looking west.

Photograph 4: From the middle of the eastern boundary of the project site looking northwest.

Photograph 5: From the middle of the western boundary of the project site looking east.

Photograph 6: From the middle of the western boundary of the project site looking south.

Photograph 7: . From the southeast corner of the project site looking west along the southern boundary.

Photograph 8: From the southeast corner of the project site looking north along the eastern boundary.

Attachment D

Potentially Occurring Special-Status Biological Resources

Table D-1: Potentially Occurring Special-Status Biological Resources

Scientific Name Common Name	Status	Habitat	Observed Onsite	Potential to Occur
SPECIAL-STATUS WILDLIFE SPECIES				
Accipiter cooperii Cooper's hawk	Fed: None CA: WL	Generally found in forested areas up to 3,000 feet in elevation, especially near edges and rivers. Prefers hardwood stands and mature forests, but can be found in urban and suburban areas where there are tall trees for nesting. Common in open areas during nesting season.	No	**Low.** The project site provides minimal foraging habitat. This species is adapted to urban areas and occurs commonly.
Accipiter gentilis northern goshawk	Fed: None CA: SSC	Includes a variety of forest types and stand structures, depending on geographic location. In general, they appear to prefer relatively dense forests with large trees and relatively high canopy closures which are used for protection from predators, increased food availability, and limited exposure to cold temperatures and precipitation.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Accipiter striatus sharp-shinned hawk	Fed: None CA: WL	Found in pine, fir, and aspen forests. They can be found hunting in forest interior and edges from sea level to near alpine areas. Can also be found in rural, suburban, and agricultural areas, where they often hunt at bird feeders. Typically found in southern California in the winter months.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Agelaius tricolor tricolored blackbird	Fed: None CA: **THR**; SSC	Highly colonial yearlong resident of California that frequents emergent wetlands, croplands, grassy fields, flooded land and along edges of ponds. Usually nests near fresh water, preferably in emergent wetland with tall, dense cattails (*Typha sp.*) or tules (*Schoenoplectus sp.*), but also in thickets of willow (*Salix sp.*), blackberry (*Rubus sp.*), and tall herbs.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Aimophila ruficeps canescens southern California rufous-crowned sparrow	Fed: None CA: WL	Typically found between 3,000 and 6,000 feet in elevation. Breed in sparsely vegetated shrublands on hillsides and canyons. Prefers coastal sage scrub dominated by California sagebrush (*Artemisia californica*) but can also be found breeding in coastal bluff scrub, low-growing serpentine chaparral, and along the edges of tall chaparral habitats.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Anniella stebbinsi southern California legless lizard	Fed: None CA: SSC	Mostly found in coastal sand dunes and a variety of interior habitats, including sandy washes and alluvial fans. They live mostly underground, burrowing in the loose sandy soils.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.

Scientific Name Common Name	Status	Habitat	Observed Onsite	Potential to Occur
Aquila chrysaetos golden eagle	Fed: None CA: FP; WL	Occupies nearly all terrestrial habitats of the western states except densely forested areas. Favors secluded cliffs with overhanging ledges and large trees for nesting and cover. Hilly or mountainous country where takeoff and soaring are supported by updrafts is generally preferred to flat habitats. Deeply cut canyons rising to open mountain slopes and crags are ideal habitat.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Ardea alba great egret	Fed: None CA: None	Yearlong resident throughout California, except for the high mountains and deserts. Feeds and rests in fresh, and saline emergent wetlands, along the margins of estuaries, lakes, and slow-moving streams, on mudflats and salt ponds, and in irrigated croplands and pastures.	Yes	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Ardea herodias great blue heron	Fed: None CA: None	Fairly common all year throughout most of California, in shallow estuaries and fresh and saline emergent wetlands. Less common along riverine and rocky marine shores, in croplands, pastures, and in mountains about foothills.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Arizona elegans occidentalis California glossy snake	Fed: None CA: SSC	Inhabits arid scrub, rocky washes, grassland, and chaparral. Appears in microhabitats of open areas and areas with soil loose enough for easy burrowing.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Artemisiospiza belli belli Bell's sage sparrow	Fed: None CA: WL	Occurs in chaparral dominated by fairly dense stands of chamise. Also found in coastal sage scrub in south of range.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Aspidoscelis hyperythra orangethroat whiptail	Fed: None CA: WL	Inhabits low-elevations coastal scrub, chamise-redshank chaparral, mixed chaparral, and valley-foothill hardwood habitats. Semi-arid brushy areas typically with loose soil and rocks, including washes, streamsides, rocky hillsides, and coastal chaparral.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Aspidoscelis tigris stejnegeri coastal whiptail	Fed: None CA: SSC	Found in a variety of ecosystems, primarily hot and dry open areas with sparse foliage - chaparral, woodland, and riparian areas.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.

Scientific Name Common Name	Status	Habitat	Observed Onsite	Potential to Occur
Athene cunicularia burrowing owl	Fed: None CA: SSC	Primarily a grassland species, but it persists and even thrives in some landscapes highly altered by human activity. Occurs in open, annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. The overriding characteristics of suitable habitat appear to be burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation.	No	**Presumed Absent.** The project site provides line-of-sight opportunities favored by burrowing owls; however, no suitable burrows (>4 inches) are present. The presence of illicit camping and feral cats further precludes burrowing owls from the site.
Bombus crotchii Crotch bumble bee	Fed: None CA: CE	Exclusive to coastal California east towards the Sierra-Cascade Crest; less common in western Nevada.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Buteo swainsoni Swainson's hawk	Fed: None CA: **THR**	Typical habitat is open desert, grassland, or cropland containing scattered, large trees or small groves. Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Forages in adjacent grassland or suitable grain or alfalfa fields or livestock pastures.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Calypte costae Costa's hummingbird	Fed: None CA: None	Desert and semi-desert, arid brushy foothills and chaparral. A desert hummingbird that breeds in the Sonoran and Mojave Deserts. Departs desert heat moving into chaparral, scrub, and woodland habitats.	Yes	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Catostomus santaanae Santa Ana sucker	Fed: **THR** CA: None	Occur in the watersheds draining the San Gabriel and San Bernardino Mountains of southern California. Steams that Santa Ana Sucker inhabit are generally perennial streams with water ranging in depth from a few inches to several feet and with currents ranging from slight to swift.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Chaetodipus fallax fallax northwestern San Diego pocket mouse	Fed: None CA: SSC	Occurs in desert and coastal habitats in southern California, Mexico, and northern Baja California, from sea level to at least 1,400 meters above msl. Found in a variety of temperate habitats ranging from chaparral and grasslands to scrub forests and deserts. Requires low growing vegetation or rocky outcroppings, as well as sandy soils for burrowing.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.

Scientific Name Common Name	Status	Habitat	Observed Onsite	Potential to Occur
Chaetodipus fallax pallidus pallid San Diego pocket mouse	Fed: None CA: SSC	Common resident of sandy herbaceous areas, usually in association with rocks or course gravel in southwestern California. Occurs mainly in arid coastal and desert border areas. Habitats include coastal scrub, chamise-redshank chaparral, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent shrub, pinyon-juniper, and annual grassland.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Chaetura vauxi Vaux's swift	Fed: None CA: SSC	Prefers redwood and Douglas-fir habitats with nest-sites in large hollow trees and snags, especially tall, burned-out stubs.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Coccyzus americanus occidentalis western yellow-billed cuckoo	Fed: **THR** CA: **END**	In California, the breeding distrution is now thought to be restricted to isolated sites in Sacramento, Amargosa, Kern, Santa Ana, and Colorado River valleys. Obligate riparian species with a primary habitat association of willow-cottonwood riparian forest.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Coleonyx variegatus abbotti San Diego banded gecko	Fed: None CA: SSC	Prefers rocky coastal sage and chaparral habitat with granite outcrops. Also occurs in dry, rocky riverbeds. Species avoids areas with a high intensity of artificial night lighting.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Contopus cooperi olive-sided flycatcher	Fed: None CA: SSC	Uncommon summer resident of southern California. Occurs in a wide variety of forest and woodland habitats. Preferred nesting and roosting habitat includes mixed conifer, montane hardwood-conifer, Douglas-fir, redwood, red fir, and lodgepole pine forests where tall tress overlook canyons, meadows, lakes, or other open terrain.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Crotalus ruber red-diamond rattlesnake	Fed: None CA: SSC	It can be found from the desert, through dense chaparral in the foothills (it avoids the mountains above around 4,000 feet), to warm inland mesas and valleys, all the way to the cool ocean shore. It is most commonly associated with heavy brush with large rocks or boulders. Dense chaparral in the foothills, cactus or boulder associated coastal sage scrub, oak and pine woodlands, and desert slope scrub associations are known to carry populations of the northern red-diamond rattlesnake; however, chamise and red shank associations may offer better structural habitat for refuges and food resources for this species than other habitats.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Diadophis punctatus modestus San Bernardino ringneck snake	Fed: None CA: None	Common in open, relatively rocky areas within valley-foothill, mixed chaparral, and annual grass habitats.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Dipodomys merriami parvus San Bernardino kangaroo rat	Fed: **END** CA: CE; SSC	Primarily found in Riversidian alluvial fan sage scrub and sandy loam soils, alluvial fans and flood plains, and along washes with nearby sage scrub. May occur at lower densities in Riversidian upland sage scrub, chaparral and grassland in uplands and tributaries in proximity to Riversidian alluvial fan sage scrub habitats. Tend to avoid rocky substrates and prefer sandy loam substrates for digging of shallow burrows.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Dipodomys simulans Dulzura kangaroo rat	Fed: None CA: None	Typical habitat is open desert, grassland, or cropland containing scattered, large trees or small groves. Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Forages in adjacent grassland or suitable grain or alfalfa fields or livestock pastures.		**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Dipodomys stephensi Stephens' kangaroo rat	Fed: **END** CA: **THR**	Occur in arid and semi-arid habitats with some grass or brush. Prefer open habitats with less than 50% protective cover. Require soft, well-drained substrate for building burrows and are typically found in areas with sandy soil.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Egretta thula snowy egret	Fed: None CA: None	Widespread in California along shores of coastal estuaries, fresh and saline emergent wetlands, ponds, slow-moving rivers, irrigation ditches, and wet fields. In southern California, common yearlong in the Imperial Valley and along the Colorado River.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Empidonax traillii willow flycatcher	Fed: None CA: **END**	Occurs in riparian woodlands in southern California. Typically requires large areas of willow thickets in broad valleys, canyon bottoms, or around ponds and lakes. These areas typically have standing or running water, or are at least moist.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Empidonax traillii extimus southwestern willow flycatcher	Fed: **END** CA: **END**	Occurs in riparian woodlands in southern California. Typically requires large areas of willow thickets in broad valleys, canyon bottoms, or around ponds and lakes. These areas typically have standing or running water, or are at least moist.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Eugnosta busckana Busck's gallmoth	Fed: None CA: None	Inhabits coastal scrub dunes.		**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Eumops perotis californicus western mastiff bat	Fed: None CA: SSC	Primarily a cliff-dwelling species, roost generally under exfoliating rock slabs. Roosts are generally high above the ground, usually allowing a clear vertical drop of at least three meters below the entrance for flight. In California, it is most frequently encountered in broad open areas. Its foraging habitat includes dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, and agricultural areas.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Euphydryas editha quino Quino checkerspot butterfly	Fed: **END** CA: None	Range is now limited to a few populations in Riverside and San Diego counties. Common in meadows and upland sage scrub/chapparal habitat.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Falco columbarius merlin	Fed: None CA: WL	Nest in forested openings, edges, and along rivers across northern North America. Found in open forests, grasslands, and especially coastal areas with flocks of small songbirds or shorebirds.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Falco mexicanus prairie falcon	Fed: None CA: WL	Commonly occur in arid and semiarid shrubland and grassland community types. Also occasionally found in open parklands within coniferous forests. During the breeding season, they are found commonly in foothills and mountains which provide cliffs and escarpments suitable for nest sites.		**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Gila orcuttii arroyo chub	Fed: None CA: SSC	Warm streams of the Los Angeles Plain, which are typically muddy torrents during the winter, and clear quiet brooks in the summer, possibly drying up in places. They are found both in slow-moving and fast-moving sections, but generally deeper than 40 cm.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Glaucomys oregonensis californicus San Bernardino flying squirrel	Fed: None CA: SSC	Occurs in white fir (*Abies concolor*) and Jeffrey pine (*Pinus jeffreyi*) mixed conifer forests with black oak (*Quercus kelloggii*) components at higher elevations. Use cavities in large trees, snags, and logs for cover. Habitats are typically mature, dense conifer forest in close proximity to riparian areas.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Gymnogyps californianus California condor	Fed: **END** CA: **END**;FP	Permanent resident of the semi-arid, rugged mountain ranges surrounding the southern San Joaquin Valley, including the Coast Ranges from Santa Clara Co. south to Los Angeles Co., the Transverse Ranges, Tehachapi Mts., and southern Sierra Nevada. Forages over wide areas of open rangelands, roots on cliffs and in large trees and snags.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Icteria virens yellow-breasted chat	Fed: None CA: SSC	Primarily found in tall, dense, relatively wide riparian woodlands and thickets of willows, vine tangles, and dense brush with well-developed understories. Nesting areas are associated with streams, swampy ground, and the borders of small ponds. Breeding habitat must be dense to provide shade and concealment. It winters south the Central America.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Lanius ludovicianus loggerhead shrike	Fed: None CA: SSC	Often found in broken woodlands, shrublands, and other habitats. Prefers open country with scattered perches for hunting and fairly dense brush for nesting.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Lasiurus xanthinus western yellow bat	Fed: None CA: SSC	Roosts in palm trees in foothill riparian, desert wash, and palm oasis habitats with access to water for foraging.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Laterallus jamaicensis coturniculus California black rail	Fed: None CA: **THR**; FP	Shallow marshes, and wet meadows; in winter, drier fresh-water and brackish marshes, as well as dense, deep grass.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Lepus californicus bennettii San Diego black-tailed jackrabbit	Fed: None CA: SSC	Found in diverse habitats, but primarily is found in arid regions supporting shortgrass habitats. Openness of open scrub habitat is preferred over dense chaparral.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Neotoma lepida intermedia San Diego desert woodrat	Fed: None CA: SSC	Occurs in coastal scrub communities between San Luis Obispo and San Diego Counties. Prefers moderate to dense canopies, and especially rocky outcrops.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Nyctinomops femorosaccus pocketed free-tailed bat	Fed: None CA: SSC	Often found in pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Oncorhynchus mykiss irideus pop. 10 steelhead – southern California DPS	Fed: **END** CA: None	Found in permanent coastal streams from San Diego to the Smith River.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Onychomys torridus ramona southern grasshopper mouse	Fed: None CA: SSC	Common in alkali desert scrub and desert scrub habitats with lower densities in other desert habitats such as succulent shrub, wash, and riparian areas. Also occurs in coastal scrub, mixed chaparral, sagebrush scrub, and bitterbrush scrub habitats. Uncommon in valley foothills and montane riparian habitats.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Perognathus longimembris brevinasus Los Angeles pocket mouse	Fed: None CA: SSC	Resides in lower elevation grasslands and coastal sage scrub communities in and around the Los Angeles Basin. Prefers open ground with fine sandy soils. May not dig extensive burrows, but instead will seek refuge under weeds and dead leaves instead.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Phalacrocorax auritus double-crested cormorant	Fed: None CA: WL	Common yearlong resident in southern California. Occurs widely in freshwater and marine habitats along coastlines. Require open water where they can forage for schooling fish.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Phrynosoma blainvillii coast horned lizard	Fed: None CA: SSC	Found in a wide variety of vegetation types including coastal sage scrub, annual grassland, chaparral, oak woodland, riparian woodland and coniferous forest. In inland areas, this species is restricted to areas with pockets of open microhabitat, created by disturbance (i.e. fire, floods, roads, grazing, fire breaks). The key elements of such habitats are loose, fine soils with a high sand fraction; an abundance of native ants or other insects; and open areas with limited overstory for basking and low, but relatively dense shrubs for refuge.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Polioptila californica californica coastal California gnatcatcher	Fed: **THR** CA: SSC	Obligate resident of sage scrub habitats that are dominated by California sagebrush. This species generally occurs below 750 feet elevation in coastal regions and below 1,500 feet inland. It prefers habitat with more low-growing vegetation.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Progne subis purple martin	Fed: None CA: SSC	Summer resident in a variety of wooded, low-elevation habitats throughout the state. Uses valley foothill and montane hardwood, valley foothill and montane hardwood-conifer, and riparian habitats. Also occurs in coniferous habitats, including closed-cone pine-cypress, ponderosa pine, Douglas-fir, and redwood.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Pyrocephalus rubinus vermilion flycatcher	Fed: None CA: SSC	Occupies desert riparian habitat, particularly cottonwoods, willows, mesquite, and other large desert riparian trees, in habitat adjacent to irrigated fields, irrigation ditches, pastures, and other open, mesic areas where it can forage.		**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Rana draytonii California red-legged frog	Fed: **THR** CA: SSC	Found mainly near ponds in humid forests, woodlands, grasslands, coastal scrub, and streamsides with plant cover. Most common in lowlands or foothills. Frequently found in woods adjacent to streams. Occurs along the coast ranges from Mendocino County south and in portions of the Sierra Nevada and Cascades ranges.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Rhaphiomidas terminatus abdominalis Delhi Sands flower-loving fly	Fed: **END** CA: None	DSF habitat is limited to areas that include Delhi fine sand, an aeolian (wind-deposited) soil type. The highest density of DSF have been found in habitat that includes a variety of plants including California buckwheat, California croton, deerweed, and telegraph weed.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Setophaga petechia yellow warbler	Fed: None CA: SSC	Nests over all of California except the Central Valley, the Mojave Desert region, and high altitudes and the eastern side of the Sierra Nevada. Winters along the Colorado River and in parts of Imperial and Riverside Counties. Nests in riparian areas dominated by willows, cottonwoods, sycamores, or alders or in mature chaparral. May also use oaks, conifers, and urban areas near stream courses.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Spea hammondii western spadefoot	Fed: None CA: SSC	Prefers open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washed, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Rainpools which do not contain bullfrogs, fish, or crayfish are necessary for breeding.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Sphyrapicus ruber red-breasted sapsucker	Fed: None CA: None	An uncommon to fairly common, yearlong or summer resident in openly wooded, mountainous parts of California. In southern California, an uncommon summer resident locally in the higher mountains. Preferred nesting habitats include montane riparian, aspen, montane hardwood-conifer, mixed conifer, and red fir, especially near meadows, clearings, lakes, and slow-moving streams.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Spinus lawrencei Lawrence's goldfinch	Fed: None CA: None	Typical habitats include valley foothill hardwood, valley foothill hardwood-conifer, and, in southern California, desert riparian, palm oasis, pinyon-juniper, and lower montane habitats. Nearby herbaceous habitats often used for feeding. Open woodlands, chaparral, and weedy fields. Closely associated with oaks. Nests in open oak or other arid woodland and chaparral near water.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.

Scientific Name Common Name	Status	Habitat	Observed Onsite	Potential to Occur
Taxidea taxus American badger	Fed: None CA: SSC	Primarily occupy grasslands, parklands, farms, tallgrass and shortgrass prairies, meadows, shrub-steppe communities and other treeless areas with sandy loam soils where it can dig more easily for its prey. Occasionally found in open chaparral (with less than 50% plant cover) and riparian zones.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Thamnophis hammondii two-striped gartersnake	Fed: None CA: SSC	Occurs in or near permanent fresh water, often along streams with rocky beds and riparian growth up to 7,000 feet in elevation.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
***Thamnophis sirtalis* pop. 1** south coast gartersnake	Fed: None CA: SSC	Utilizes a variety of habitats including forests, mixed woodlands, grassland, chaparral, and farmlands. Often found near ponds, marshes, or streams.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Vireo bellii pusillus least Bell's vireo	Fed: **END** CA: **END**	Primarily occupy Riverine riparian habitat that typically feature dense cover within 1 -2 meters of the ground and a dense, stratified canopy. Typically it is associated with southern willow scrub, cottonwood-willow forest, mule fat scrub, sycamore alluvial woodlands, coast live oak riparian forest, arroyo willow riparian forest, or mesquite in desert localities. It uses habitat which is limited to the immediate vicinity of water courses, 2,000 feet elevation in the interior.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Xanthocephalus xanthocephalus yellow-headed blackbird	Fed: None CA: SSC	Uncommon yearlong resident of southern California throughout freshwater emergent wetlands, and moist, open areas along agricultural areas, and mudflats of lacustrine habitats. Prefers to nest in dense wetland vegetation characterized by cattails, tules, or other similar plant species along the border of lakes and ponds.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
SPECIAL-STATUS PLANT SPECIES				
Arenaria paludicola marsh sandwort	Fed: **END** CA: **END** CNPS: 1B.1	Grows mainly in wetlands and freshwater marshes in arid climates. The plant can grow in saturated acidic bog soils and soils that are sandy with a high organic content. Found at elevations ranging from 33 to 558 feet. Blooming period is from May to August.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Asplenium vespertinum western spleenwort	Fed: None CA: None CNPS: 4.2	Found in rocky soils in chaparral, cismontane woodland, and coastal scrub. Found at elevations ranging from 115 to 3,410 feet. Blooming period is from February to June.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.

Scientific Name Common Name	Status	Habitat	Observed Onsite	Potential to Occur
Astragalus hornii* var. *hornii Horn's milk-vetch	Fed: None CA: None CNPS: 1B.1	Occurs in lake margins in playas, meadows and seeps. Found at elevations ranging from 197 to 2,789 feet. Blooming period is from May to October.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Carex comosa bristly sedge	Fed: None CA: None CNPS: 2B.1	Grows in coastal prairie, lake margins, valley and foothill grassland habitat. Grows in elevation ranging from 0 to 2,051 feet. Blooming period is from May to September.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Centromadia pungens* ssp. *laevis smooth tarplant	Fed: None CA: None CNPS: 1B.1	Occurs in alkaline soils within chenopod scrub, meadows and seeps, playas, riparian woodland, and valley and foothill grassland habitats. Grows in elevation ranging from 0 to 2,100 feet. Blooming period ranges from April to September.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Chloropyron maritimum* ssp. *maritimum salt marsh bird's-beak	Fed: **END** CA: **END** CNPS: 1B.2	Upper terraces and higher edges of coastal salt marshes where tidal inundation is periodic. Found at elevations ranging from 0 to 99 feet. Blooming period is from May to October.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Chorizanthe leptotheca Peninsular spineflower	Fed: None CA: None CNPS: 4.2	Found in granitic soils within alluvial fan, chaparral, coastal scrub, and lower montane coniferous forest habitat. Found at elevations ranging from 984 to 6,234 feet. Blooming period is from May to August.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Chorizanthe parryi* var. *parryi Parry's spineflower	Fed: None CA: None CNPS: 1B.1	Occurs on sandy and/or rocky soils in chaparral, coastal sage scrub, and sandy openings within alluvial washes and margins. Found at elevations ranging from 951 to 3,773 feet. Blooming period is from April to June.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Cuscuta obtusiflora* var. *glandulosa Peruvian dodder	Fed: None CA: None CNPS: 2B.2	Found in freshwater marshes and swamps. Grows at elevations ranging from 49 to 919 feet. Blooming period is from July to October.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Dodecahema leptoceras slender-horned spineflower	Fed: **END** CA: **END** CNPS: 1B.1	Chaparral, coastal scrub (alluvial fan sage scrub). Flood deposited terraces and washes. Found at elevations ranging from 1,181 to 2,690 feet. Blooming period is from April to June.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Eriastrum densifolium* ssp. *sanctorum Santa Ana River woollystar	Fed: **END** CA: **END** CNPS: 1B.1	Grows in sandy or gravelly soils within chaparral and coastal scrub habitat. Found at elevations ranging from 299 to 2,001 feet. Blooming period is from April to September.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.

Scientific Name Common Name	Status	Habitat	Observed Onsite	Potential to Occur
Galium californicum* ssp. *primum Alvin Meadow bedstraw	Fed: None CA: None CNPS: 1B.2	Prefers granitic and sandy soils in chaparral and lower montane coniferous forest habitats. Found at elevations ranging from 4,429 to 5,577 feet. Blooming period is from May to July.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Helianthus nuttallii* ssp. *parishii Los Angeles sunflower	Fed: None CA: None CNPS: 1A	Occurs in marshes, swamps, and on damp river banks. Found at elevations ranging from 16 to 5,495 feet. Blooming period is from August to October.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Horkelia cuneata* var. *puberula mesa horkelia	Fed: None CA: None CNPS: 1B.1	Occurs on sandy or gravelly soils in chaparral, woodlands, and coastal scrub plant communities. Found at elevations ranging from 230 to 2,657 feet. Blooming period is from February to September.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Juglans californica southern California black walnut	Fed: None CA: None CNPS: 4.2	Found in chaparral, cismontane woodland, coastal scrub, and riparian woodland habitats. Found at elevations ranging from 164 to 2,953 feet. Blooming period is from March to August.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Lepidium virginicum* var. *robinsonii Robinson's pepper-grass	Fed: None CA: None CNPS: 4.3	Dry soils on chaparral and coastal sage scrub. Found at elevations ranging from 3 to 2,904 feet. Blooming period is from January to July.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Lycium parishii Parish's desert-thorn	Fed: None CA: None CNPS: 2B.3	Habitats include coastal scrub and Sonoran desert scrub. Found at elevations ranging from 443 to 3,281 feet. Blooming period is from March to April.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Malacothamnus parishii Parish's bush-mallow	Fed: None CA: None CNPS: 1A	Grows in chaparral and coastal scrub habitats. Found at elevations ranging from 1,001 to 1,493 feet. Blooming period is from June to July.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Monardella pringlei Pringle's monardella	Fed: None CA: None CNPS: 1A	Prefers sandy soils within coastal scrub habitat. Found at elevations ranging from 984 to 1,312 feet. Blooming period is from May to June.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Nasturtium gambelii Gambel's water cress	Fed: **END** CA: **THR** CNPS: 1B.1	Brackish marsh, freshwater marsh, swamps, and wetlands. Found at elevations ranging from 16 to 1,083 feet. Blooming period is from April to October.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Ribes divaricatum* var. *parishii Parish's gooseberry	Fed: None CA: None CNPS: 1A	Found in riparian woodland and other riparian habitats. Found at elevations ranging from 213 to 984 feet. Blooming period is from February to April.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Senecio aphanactis chaparral ragwort	Fed: None CA: None CNPS: 2B.2	Found in sometimes alkaline soils in chaparral, cismontane woodland, and coastal scrub. Found at elevations ranging from 425 to 2,165 feet. Blooming period is from January to April.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Sidalcea neomexicana Salt Spring checkerbloom	Fed: None CA: None CNPS: 2B.2	Habitat includes chaparral, coastal scrub, lower montane coniferous forest, plays, and mojavean desert scrub. Found at elevations ranging from 49 to 5,020 feet. Blooming period is from March to June.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Sphenopholis obtusata prairie wedge grass	Fed: None CA: None CNPS: 2B.2	Prefers cismontane woodland, meadows and seeps. Found at elevations ranging from 984 to 6,562 feet. Blooming period is from April to July.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
Symphyotrichum defoliatum San Bernardino aster	Fed: None CA: None CNPS: 1B.2	Grows in cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps, valley and foothill grassland (vernally mesic). Can be found growing near ditches, streams, and springs within these habitats. Found at elevations ranging from 7 to 6,693 feet. Blooming period is from July to November.	No	**Presumed Absent.** No suitable habitat is present within or adjacent to the project site.
SPECIAL-STATUS PLANT COMMUNITIES				
Riversidian Alluvial Fan Sage Scrub	CDFW Sensitive Habitat	Occur within broad washes of sandy alluvial drainages that carry rainfall runoff sporadically in winter and spring, but remain relatively dry through the remainder of the year. Is restricted to drainages and floodplains with very sandy substrates that have a dearth of decomposed plant material. These areas do not develop into riparian woodland or scrub due to the limited water resources and scouring by occasional floods.	No	**Absent**
Southern Cottonwood Willow Riparian Forest	CDFW Sensitive Habitat	Dominated by cottonwood (*Populus* sp.) and willow (*Salix* sp.) trees and shrubs. Considered to be an early successional stage as both species are known to germinate almost exclusively on recently deposited or exposed alluvial soils.	No	**Absent**
Southern Riparian Scrub	CDFW Sensitive Habitat	Riparian zones dominated by small trees or shrubs, lacking taller riparian trees.	No	**Absent**

U.S. Fish and Wildlife Service (USFWS) - Federal

END- Federal Endangered
THR- Federal Threatened
Candidate END – Under Review

California Department of Fish and Wildlife (CDFW) - California

END- California Endangered
CSC- California Species of Concern
WL- Watch List
FP- California Fully Protected

California Native Plant Society (CNPS)

California Rare Plant Rank

1A- Plants Presumed Extirpated in California and Either Rare or Extinct Elsewhere
1B- Plants Rare, Threatened, or Endangered in California and Elsewhere
2B- Plants Rare, Threatened, or Endangered in California, but More Common Elsewhere
4- Plants of Limited Distribution – A Watch List

Threat Ranks

0.1- Seriously threatened in California
0.2- Moderately threatened in California
0.3- Not very threatened in California

Attachment E

Regulations

Special status species are native species that have been afforded special legal or management protection because of concern for their continued existence. There are several categories of protection at both federal and state levels, depending on the magnitude of threat to continued existence and existing knowledge of population levels.

Federal Regulations

Endangered Species Act of 1973

Federally listed threatened and endangered species and their habitats are protected under provisions of the Federal Endangered Species Act (ESA). Section 9 of the ESA prohibits "take" of threatened or endangered species. "Take" under the ESA is defined as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any of the specifically enumerated conduct." The presence of any federally threatened or endangered species that are in a project area generally imposes severe constraints on development, particularly if development would result in "take" of the species or its habitat. Under the regulations of the ESA, the United States Fish and Wildlife Service (USFWS) may authorize "take" when it is incidental to, but not the purpose of, an otherwise lawful act.

Critical Habitat is designated for the survival and recovery of species listed as threatened or endangered under the ESA. Critical Habitat includes those areas occupied by the species, in which are found physical and biological features that are essential to the conservation of an ESA listed species and which may require special management considerations or protection. Critical Habitat may also include unoccupied habitat if it is determined that the unoccupied habitat is essential for the conservation of the species.

Whenever federal agencies authorize, fund, or carry out actions that may adversely modify or destroy Critical Habitat, they must consult with USFWS under Section 7 of the ESA. The designation of Critical Habitat does not affect private landowners, unless a project they are proposing uses federal funds, or requires federal authorization or permits (e.g., funding from the Federal Highway Administration or a permit from the U.S. Army Corps of Engineers (Corps)).

If USFWS determines that Critical Habitat will be adversely modified or destroyed from a proposed action, the USFWS will develop reasonable and prudent alternatives in cooperation with the federal institution to ensure the purpose of the proposed action can be achieved without loss of Critical Habitat. If the action is not likely to adversely modify or destroy Critical Habitat, USFWS will include a statement in its biological opinion concerning any incidental take that may be authorized and specify terms and conditions to ensure the agency is in compliance with the opinion.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 U.S. Government Code [USC] 703) makes it unlawful to pursue, capture, kill, possess, or attempt to do the same to any migratory bird or part, nest, or egg of any such bird listed in wildlife protection treaties between the United States, Great Britain, Mexico, Japan, and the countries of the former Soviet Union, and authorizes the U.S. Secretary of the Interior to protect and regulate the taking of migratory birds. It establishes seasons and bag limits for hunted species and protects migratory birds, their occupied nests, and their eggs (16 USC 703; 50 CFR 10, 21).

The MBTA covers the taking of any nests or eggs of migratory birds, except as allowed by permit pursuant to 50 CFR, Part 21. Disturbances causing nest abandonment and/or loss of reproductive effort (i.e., killing or abandonment of eggs or young) may also be considered "take." This regulation seeks to protect migratory birds and active nests.

In 1972, the MBTA was amended to include protection for migratory birds of prey (e.g., raptors). Six families of raptors occurring in North America were included in the amendment: Accipitridae (kites, hawks, and eagles); Cathartidae (New World vultures); Falconidae (falcons and caracaras); Pandionidae (ospreys); Strigidae (typical owls); and Tytonidae (barn owls). The provisions of the 1972 amendment to the MBTA protects all species and subspecies of the families listed above. The MBTA protects over 800 species including geese, ducks, shorebirds, raptors, songbirds and many relatively common species.

State Regulations

California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) provides for the protection of the environment within the State of California by establishing State policy to prevent significant, avoidable damage to the environment through the use of alternatives or mitigation measures for projects. It applies to actions directly undertaken, financed, or permitted by State lead agencies. If a project is determined to be subject to CEQA, the lead agency will be required to conduct an Initial Study (IS); if the IS determines that the project may have significant impacts on the environment, the lead agency will subsequently be required to write an Environmental Impact Report (EIR). A finding of non-significant effects will require either a Negative Declaration or a Mitigated Negative Declaration instead of an EIR. Section 15380 of the CEQA Guidelines independently defines "endangered" and "rare" species separately from the definitions of the California Endangered Species Act (CESA). Under CEQA, "endangered" species of plants or animals are defined as those whose survival and reproduction in the wild are in immediate jeopardy, while "rare" species are defined as those who are in such low numbers that they could become endangered if their environment worsens.

California Endangered Species Act (CESA)

In addition to federal laws, the state of California implements the CESA which is enforced by CDFW. The CESA program maintains a separate listing of species beyond the FESA, although the provisions of each act are similar.

State-listed threatened and endangered species are protected under provisions of the CESA. Activities that may result in "take" of individuals (defined in CESA as; "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill") are regulated by CDFW. Habitat degradation or modification is not included in the definition of "take" under CESA. Nonetheless, CDFW has interpreted "take" to include the destruction of nesting, denning, or foraging habitat necessary to maintain a viable breeding population of protected species.

The State of California considers an endangered species as one whose prospects of survival and reproduction are in immediate jeopardy. A threatened species is considered as one present in such small numbers throughout its range that it is likely to become an endangered species in the near future in the absence of special protection or management. A rare species is one that is considered present in such small numbers throughout its range that it may become endangered if its present environment worsens. State threatened and endangered species are fully protected against take, as defined above.

The CDFW has also produced a species of special concern list to serve as a species watch list. Species on this list are either of limited distribution or their habitats have been reduced substantially, such that a threat to their populations may be imminent. Species of special concern may receive special attention during environmental review, but they do not have formal statutory protection. At the federal level, USFWS also uses the label species of concern, as an informal term that refers to species which might be in need of concentrated conservation actions. As the Species of Concern designated by USFWS do not receive formal legal protection, the use of the term does not necessarily ensure that the species will be proposed for listing as a threatened or endangered species.

Fish and Game Code

Fish and Game Code Sections 3503, 3503.5, 3511, and 3513 are applicable to natural resource management. For example, Section 3503 of the Code makes it unlawful to destroy any birds' nest or any birds' eggs that are protected under the MBTA. Further, any birds in the orders Falconiformes or Strigiformes (Birds of Prey, such as hawks, eagles, and owls) are protected under Section 3503.5 of the Fish and Game Code which makes it unlawful to take, possess, or destroy their nest or eggs. A consultation with CDFW may be required prior to the removal of any bird of prey nest that may occur on a project site. Section 3511 of the Fish and Game Code lists fully protected bird species, where the CDFW is unable to authorize the issuance of permits or licenses to take these species. Pertinent species that are State fully protected by the State include golden eagle (*Aquila chrysaetos*) and white-tailed kite (*Elanus leucurus*). Section 3513 of the Fish and Game Code makes it unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA.

Native Plant Protection Act

Sections 1900–1913 of the Fish and Game Code were developed to preserve, protect, and enhance Rare and Endangered plants in the state of California. The act requires all state agencies to use their authority to carry out programs to conserve Endangered and Rare native plants. Provisions of the Native Plant Protection Act prohibit the taking of listed plants from the wild and require notification of the CDFW at least ten days in advance of any change in land use which would adversely impact listed plants. This allows the CDFW to salvage listed plant species that would otherwise be destroyed.

California Native Plant Society Rare and Endangered Plant Species

Vascular plants listed as rare or endangered by the CNPS, but which have no designated status under FESA or CESA are defined as follows:

California Rare Plant Rank

1A- Plants Presumed Extirpated in California and either Rare or Extinct Elsewhere

1B- Plants Rare, Threatened, or Endangered in California and Elsewhere

2A- Plants Presumed Extirpated in California, But More Common Elsewhere

2B- Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

3- Plants about Which More Information is Needed - A Review List

4- Plants of Limited Distribution - A Watch List

Threat Ranks

.1- Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

.2- Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

.3- Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known).

There are three key agencies that regulate activities within inland streams, wetlands, and riparian areas in California. The Corps Regulatory Branch regulates activities pursuant to Section 404 of the Federal Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. Of the State agencies, the CDFG regulates activities under the Fish and Game Code Section 1600-1616, and the Regional Board regulates activities pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act.

Federal Regulations

Section 404 of the Clean Water Act

Since 1972, the Corps and U.S. Environmental Protection Agency (EPA) have jointly regulated the filling of "waters of the U.S.," including wetlands, pursuant to Section 404 of the Clean Water Act (CWA). The Corps has regulatory authority over the discharge of dredged or fill material into the waters of the United States under Section 404 of the CWA. The Corps and EPA define "fill material" to include any "material placed in waters of the United States where the material has the effect of: (i) replacing any portion of a water of the United States with dry land; or (ii) changing the bottom elevation of any portion of the waters of the United States." Examples include, but are not limited to, sand, rock, clay, construction debris, wood chips, and "materials used to create any structure or infrastructure in the waters of the United States." In order to further define the scope of waters protected under the CWA, the Corps and EPA published the Clean Water Rule on June 29, 2015. Pursuant to the Clean Water Rule, the term "*waters of the United States*" is defined as follows:

(i) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.

(ii) All interstate waters, including interstate wetlands[1].

(iii) The territorial seas.

(iv) All impoundments of waters otherwise defined as waters of the United States under the definition.

(v) All tributaries[2] of waters identified in paragraphs (i) through (iii) mentioned above.

(vi) All waters adjacent[3] to a water identified in paragraphs (i) through (v) mentioned above, including wetlands, ponds, lakes, oxbows, impoundments, and similar waters.

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[1] The term *wetlands* means those areas that are inundated or saturated by surface or groundwater 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.

[2] The terms *tributary* and *tributaries* each mean a water that contributes flow, either directly or through another water (including an impoundment identified in paragraph (iv) mentioned above), to a water identified in paragraphs (i) through (iii) mentioned above, that is characterized by the presence of the physical indicators of a bed and banks and an ordinary high water mark.

[3] The term *adjacent* means bordering, contiguous, or neighboring a water identified in paragraphs (i) through (v) mentioned above, including waters separated by constructed dikes or barriers, natural river berms, beach dunes, and the like.

(vii) All prairie potholes, Carolina bays and Delmarva bays, Pocosins, western vernals pools, Texas coastal prairie wetlands, where they are determined, on a case-specific basis, to have a significant nexus to a water identified in paragraphs (i) through (iii) meantioned above.

(viii) All waters located within the 100-year floodplain of a water identified in paragraphs (i) through (iii) mentioned above and all waters located within 4,000 feet of the high tide line or ordinary high water mark of a water identified in paragraphs (i) through (v) mentioned above, where they are determined on a case-specific basis to have a significant nexus to a waters identified in paragraphs (i) through (iii) mentioned above.

The following features are not defined as "waters of the United States" even when they meet the terms of paragraphs (iv) through (viii) mentioned above:

(i) Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Clean Water Act.

(ii) Prior converted cropland.

(iii) The following ditches:

  (A) Ditches with ephemeral flow that are not a relocated tributary or excavated in a tributary.
  (B) Ditches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands.
  (C) Ditches that do not flow, either directly or through another water, into a water of the United States as identified in paragraphs (i) through (iii) of the previous section.

(iv) The following features:

  (A) Artificially irrigated areas that would revert to dry land should application of water to that area cease;
  (B) Artificial, constructed lakes and ponds created in dry land such as farm and stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, log cleaning ponds, or cooling ponds;
  (C) Artificial reflecting pools or swimming pools created in dry land;
  (D) Small ornamental waters created in dry land;
  (E) Water-filled depressions created in dry land incidental to mining or construction activity, including pits excavated for obtaining fill, sand, or gravel that fill with water;
  (F) Erosional features, including gullies, rills, and other ephemeral features that do not meet the definition of a tributary, non-wetland swales, and lawfully constructed grassed waterways; and
  (G) Puddles.

(v) Groundwater, including groundwater drained through subsurface drainage systems.

(vi) Stormwater control features constructed to convey, treat, or store stormwater that are created in dry land.

(vii) Wastewater recycling structures constructed in dry land; detention and retention basins built for wastewater recycling; groundwater recharge basins; percolation ponds built for wastewater recycling; and water distributary structures built for wastewater recycling.

Section 401 of the Clean Water Act

Pursuant to Section 401 of the CWA, any applicant for a federal license or permit to conduct any activity which may result in any discharge to waters of the United States must provide certification from the State or Indian tribe in which the discharge originates. This certification provides for the protection of the physical, chemical, and biological integrity of waters, addresses impacts to water quality that may result from issuance of federal permits, and helps insure that federal actions will not violate water quality standards of the State or Indian tribe. In California, there are nine Regional Water Quality Control Boards (Regional Board) that issue or deny certification for discharges to waters of the United States and waters of the State, including wetlands, within their geographical jurisdiction. The State Water Resources Control Board assumed this responsibility when a project has the potential to result in the discharge to waters within multiple Regional Boards.

State Regulations

Fish and Game Code

Fish and Game Code Sections 1600 et. seq. establishes a fee-based process to ensure that projects conducted in and around lakes, rivers, or streams do not adversely impact fish and wildlife resources, or, when adverse impacts cannot be avoided, ensures that adequate mitigation and/or compensation is provided.

Fish and Game Code Section 1602 requires any person, state, or local governmental agency or public utility to notify the CDFW before beginning any activity that will do one or more of the following:

(1) substantially obstruct or divert the natural flow of a river, stream, or lake;
(2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or
(3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake.

Fish and Game Code Section 1602 applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the State. CDFW's regulatory authority extends to include riparian habitat (including wetlands) supported by a river, stream, or lake regardless of the presence or absence of hydric soils and saturated soil conditions. Generally, the CDFW takes jurisdiction to the top of bank of the stream or to the outer limit of the adjacent riparian vegetation (outer drip line), whichever is greater. Notification is generally required for any project that will take place in or in the vicinity of a river, stream, lake, or their tributaries. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish or other aquatic life and watercourses having a surface or subsurface flow that support or have supported riparian vegetation. A Section 1602 Streambed Alteration Agreement would be required if impacts to identified CDFW jurisdictional areas occur.

Porter Cologne Act

The California *Porter-Cologne Water Quality Control Act* gives the State very broad authority to regulate waters of the State, which are defined as any surface water or groundwater, including saline waters. The Porter-Cologne Act has become an important tool in the post SWANCC and Rapanos regulatory environment, with respect to the state's authority over isolated and insignificant waters. Generally, any person proposing to discharge waste into a water body that could affect its water quality must file a Report of Waste Discharge in the event that there is no Section 404/401 nexus. Although "waste" is partially defined as any waste substance associated with human habitation, the Regional Board also interprets this to include fill discharged into water bodies.

Appendix C
Cultural Resources Study

CULTURAL RESOURCES STUDY FOR THE 776 WEST MILL STREET PROJECT

CITY OF SAN BERNARDINO,
SAN BERNARDINO COUNTY, CALIFORNIA

APNs 0136-142-02 and 0136-151-06, -09, -11, and -19

Lead Agency:

City of San Bernardino
290 North D Street
San Bernardino, California 92401

Preparer:

Brian F. Smith and Associates, Inc.
14010 Poway Road, Suite A
Poway, California 92064

Brian F. Smith

Signature

Project Proponent:

Lilburn Corporation
1905 Business Center Drive
San Bernardino, California 92408

June 25, 2021

Archaeological Database Information

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Consulting Firm:	Brian F. Smith and Associates, Inc. 14010 Poway Road, Suite A Poway, California 92064 (858) 679-8218
Client/Project Proponent:	Lilburn Corporation 1905 Business Center Drive San Bernardino, California 92408
Report Date:	June 25, 2021
Report Title:	Cultural Resources Study for the 776 West Mill Street Project, City of San Bernardino, San Bernardino County, California (APNs 0136-142-02 and 0136-151-06, -09, -11, and -19)
Type of Study:	Phase I Cultural Resources Survey
USGS Quadrangle:	San Bernardino Land Grant, Township 1 South, Range 4 West (projected) of the *San Bernardino South, California* (7.5-minute) USGS Quadrangle
Acreage:	7.08 acres
Key Words:	Survey; no resources identified; *San Bernardino South, California* USGS Quadrangle; monitoring of grading recommended.

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MANAGEMENT SUMMARY/ABSTRACT

In response to a request from the project applicant, a cultural resources study was conducted by Brian F. Smith and Associates, Inc. (BFSA) for the 776 West Mill Street Project. The project proposes to construct a truck and trailer sales facility along with associated parking and landscaping. The 7.08-acre project is located just east of Interstate 215 (I-215) at 776 West Mill Street, City of San Bernardino, California. The project, identified as Assessor's Parcel Numbers (APNs) 0136-142-02 and 0136-151-06, -09, -11, and -19, is situated within the San Bernardino Land Grant, Township 1 South, Range 4 West (projected) of the United States Geological Survey (USGS) *San Bernardino South, California* topographic quadrangle.

The purpose of this investigation was to locate and record any cultural resources present within the project and subsequently evaluate any resources as part of the City of San Bernardino's environmental review process conducted in compliance with the California Environmental Quality Act (CEQA). The archaeological investigation of the project also includes the review of an archaeological records search performed at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton (CSU Fullerton) in order to assess previous archaeological studies and identify any previously recorded archaeological sites within the project or in the immediate vicinity. However, due to the limitations imposed by the evolving circumstances related to the COVID-19 pandemic, records search access has become limited with delays for the foreseeable future. As such, as of the date of this report, the archaeological records search results are still pending from the SCCIC at CSU Fullerton. A Sacred Lands File (SLF) search was also requested from the Native American Heritage Commission (NAHC).

Survey conditions were generally good and ground visibility was moderate due to some pockets of dense non-native weeds and grasses. The Phase I survey of the 776 West Mill Street Project did not result in the identification of any cultural resources within the project. However, the property is located adjacent to a natural water source, Lytle Creek, which would have been advantageous to the prehistoric and historic inhabitants of the region. Aerial photographs show that the property historically contained a structure in the southwestern corner, and it appears neighboring improvements occurred prior to CEQA environmental regulations impacted the property.

Based upon the results of the current study, the status of the property appears to have affected the potential to discover any surface scatters of artifacts. As such, it is recommended that all earthwork required to develop the property be monitored by a qualified archaeologist and a Native American representative. The protocols to be followed for the monitoring of the grading within the property are presented in Section 4.0 of this report. A copy of this report will be permanently filed with the SCCIC at CSU Fullerton. All notes, photographs, and other materials related to this project will be curated at the archaeological laboratory of BFSA in Poway, California.

1.0 INTRODUCTION

1.1 Project Description

The archaeological survey program for the 776 West Mill Street Project was conducted in order to comply with CEQA and City of San Bernardino environmental guidelines. The 7.08-acre project (APNs 0136-142-02 and 0136-151-06, -09, -11, and -19) is located just east of I-215 at 776 West Mill Street, City of San Bernardino, California (Figure 1.1–1). The project is situated within the San Bernardino Land Grant, Township 1 South, Range 4 West (projected) on the USGS *San Bernardino South, California* topographic quadrangle (Figure 1.1–2), and proposes the construction of a truck and trailer sales facility along with associated parking and landscaping (Figure 1.1–3). The decision to request this investigation was based upon cultural resource sensitivity of the locality as suggested by known site density and predictive modeling. Sensitivity for cultural resources in a given area is usually indicated by known settlement patterns, which in southwestern San Bernardino County were focused around freshwater resources and a food supply.

1.2 Environmental Setting

The subject property is situated between I-215 and the channelized East Branch of Lytle Creek within the city of San Bernardino, southwest San Bernardino County, California. Elevations within the project range from approximately 1,015 to 1,025 feet above mean sea level.

The project is located within the eastern portion of the San Bernardino Valley. The San Bernardino Valley is a broad inland valley that extends from the southern base of the San Bernardino and San Gabriel Mountains south to the Santa Ana Mountains and Jurupa Hills. This area is a relatively flat alluvial plain formed from sediments deposited by the Santa Ana River and its local tributaries, such as Warm, Lytle, and Mill creeks, situated within the Peninsular Ranges Geomorphic Province of southern California. The Peninsular Ranges are a series of northwest-to southeast-trending mountain ranges separated by similarly trending valleys, which make up the southernmost segment of a chain of North American Mesozoic batholiths that extend from Alaska to the southern tip of Baja California. The specific soils found on the property are characterized as Tujunga gravelly loamy sand, 0 to 9 percent slopes (TvC).

1.3 Cultural Setting

1.3.1 Prehistoric Period

Paleo Indian, Archaic Period Milling Stone Horizon, and the Late Prehistoric Shoshonean groups are the three general cultural periods represented in San Bernardino County. The following discussion of the cultural history of San Bernardino County references the San Dieguito Complex, the Encinitas Tradition, the Milling Stone Horizon, the La Jolla Complex, the Pauma Complex, and the San Luis Rey Complex, since these culture sequences have been used to describe archaeological manifestations in the region.

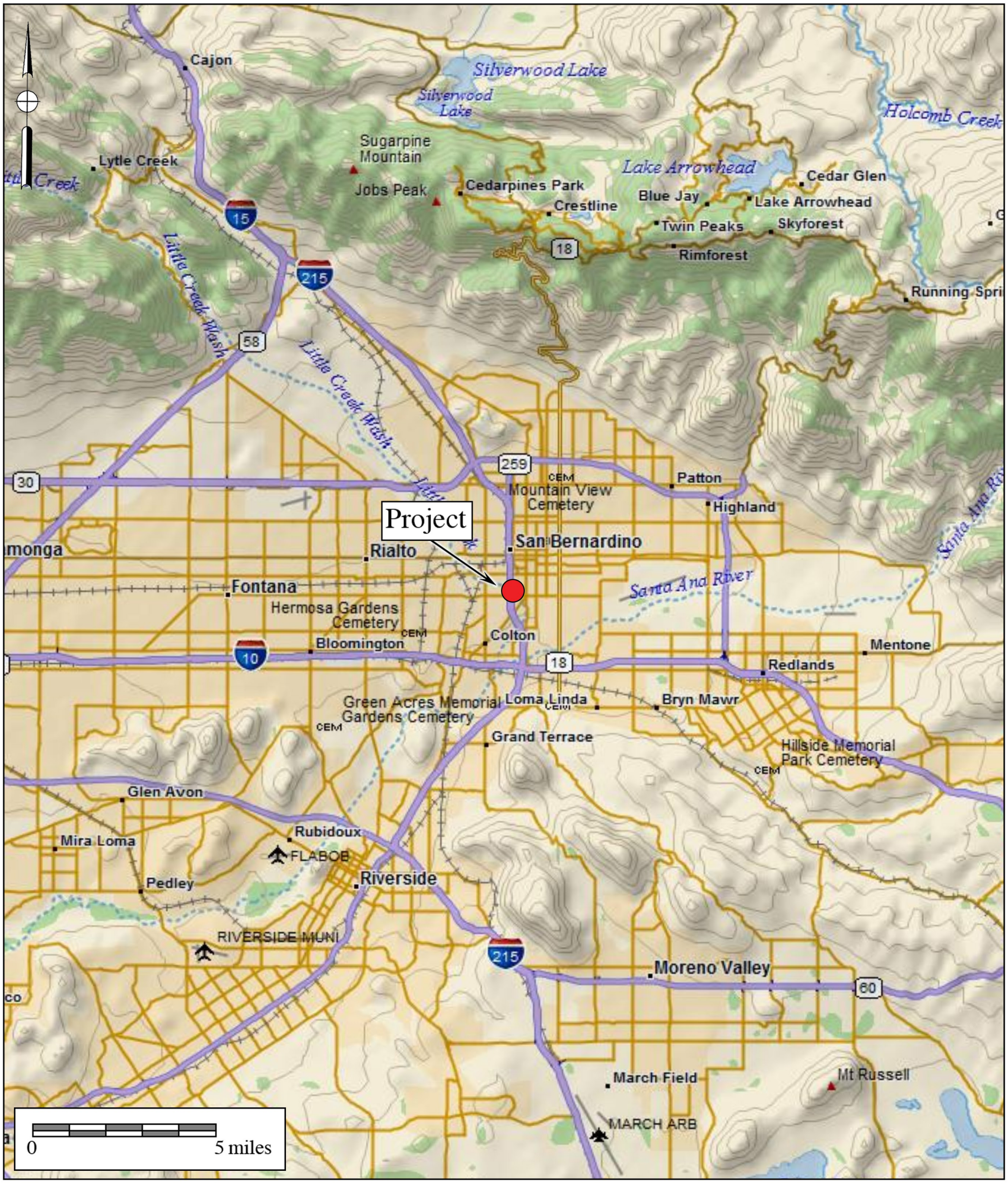

Figure 1.1–1

General Location Map

The 776 West Mill Street Project

DeLorme (1:250,000)

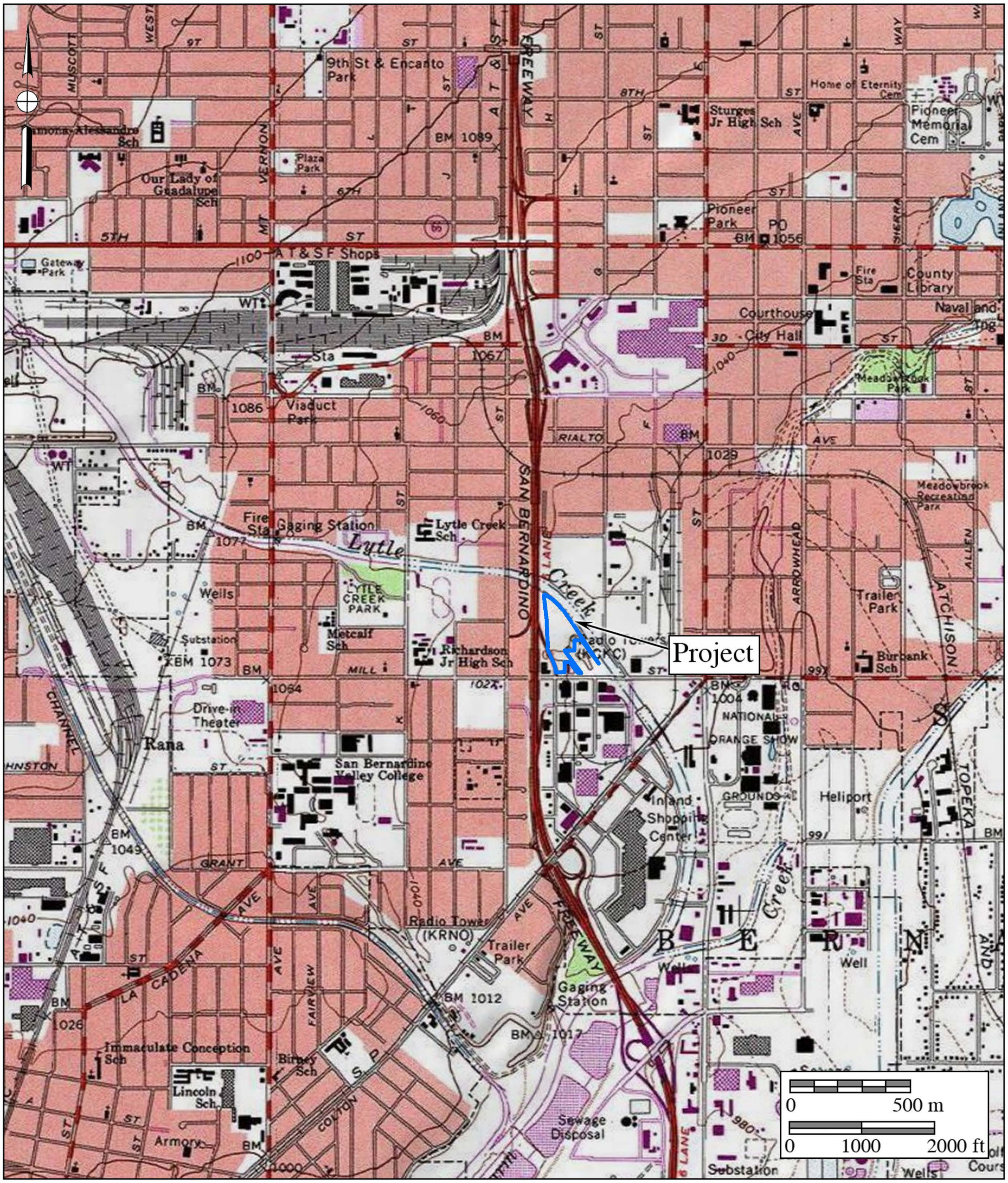

Figure 1.1–2

Project Location Map

The 776 West Mill Street Project

USGS *San Bernardino South* Quadrangle (7.5-minute series)

Figure 1.1–3

Project Development Map

The 776 West Mill Street Project

The Late Prehistoric component in the southwestern area of San Bernardino County was represented by the Gabrielino, Serrano, and potentially the Vanyume Indians. According to Kroeber (1976), the Serrano probably owned a stretch of the Sierra Madre from Cucamonga east to above Mentone and halfway up to San Timoteo Canyon, including the San Bernardino Valley and just missing Riverside County. However, Kroeber (1976) also states that this area has been assigned to the Gabrielino, "which would be a more natural division of topography, since it would leave the Serrano pure mountaineers."

Absolute chronological information, where possible, will be incorporated into this discussion to examine the effectiveness of continuing to use these terms interchangeably. Reference will be made to the geologic framework that divides the culture chronology of the area into four segments: late Pleistocene (20,000 to 10,000 years before the present [YBP]), early Holocene (10,000 to 6,650 YBP), middle Holocene (6,650 to 3,350 YBP), and late Holocene (3,350 to 200 YBP).

Paleo Indian Period (Late Pleistocene: 11,500 to circa 9,000 YBP)

The Paleo Indian Period is associated with the terminus of the late Pleistocene (12,000 to 10,000 YBP). The environment during the late Pleistocene was cool and moist, which allowed for glaciation in the mountains and the formation of deep, pluvial lakes in the deserts and basin lands (Moratto 1984). However, by the terminus of the late Pleistocene, the climate became warmer, which caused glaciers to melt, sea levels to rise, greater coastal erosion, large lakes to recede and evaporate, extinction of Pleistocene megafauna, and major vegetation changes (Moratto 1984; Martin 1967, 1973; Fagan 1991). The coastal shoreline at 10,000 YBP, depending upon the particular area of the coast, was near the 30-meter isobath, or two to six kilometers further west than its present location (Masters 1983).

Paleo Indians were likely attracted to multiple habitat types, including mountains, marshlands, estuaries, and lakeshores. These people likely subsisted using a more generalized hunting, gathering, and collecting adaptation, utilizing a variety of resources including birds, mollusks, and both large and small mammals (Erlandson and Colten 1991; Moratto 1984; Moss and Erlandson 1995).

Archaic Period (Early and Middle Holocene: circa 9000 to 1300 YBP)

The Archaic Period of prehistory began with the onset of the Holocene around 9,000 YBP. The transition from the Pleistocene to the Holocene was a period of major environmental change throughout North America (Antevs 1953; Van Devender and Spaulding 1979). The general warming trend caused sea levels to rise, lakes to evaporate, and drainage patterns to change. In southern California, the general climate at the beginning of the early Holocene was marked by cool/moist periods and an increase in warm/dry periods and sea levels. The coastal shoreline at 8,000 YBP, depending upon the particular area of the coast, was near the 20-meter isobath, or one to four kilometers further west than its present location (Masters 1983).

The rising sea level during the early Holocene created rocky shorelines and bays along the coast by flooding valley floors and eroding the coastline (Curray 1965; Inman 1983). Shorelines were primarily rocky with small littoral cells, as sediments were deposited at bay edges but rarely discharged into the ocean (Reddy 2000). These bays eventually evolved into lagoons and estuaries, which provided a rich habitat for mollusks and fish. The warming trend and rising sea levels generally continued until the late Holocene (4,000 to 3,500 YBP).

At the beginning of the late Holocene, sea levels stabilized, rocky shores declined, lagoons filled with sediment, and sandy beaches became established (Gallegos 1985; Inman 1983; Masters 1994; Miller 1966; Warren and Pavesic 1963). Many former lagoons became saltwater marshes surrounded by coastal sage scrub by the late Holocene (Gallegos 2002). The sedimentation of the lagoons was significant in that it had profound effects on the types of resources available to prehistoric peoples. Habitat was lost for certain large mollusks, namely *Chione* and *Argopecten*, but habitat was gained for other small mollusks, particularly *Donax* (Gallegos 1985; Reddy 2000). The changing lagoon habitats resulted in the decline of larger shellfish, the loss of drinking water, and the loss of Torrey Pine nuts, causing a major depopulation of the coast as people shifted inland to reliable freshwater sources and intensified their exploitation of terrestrial small game and plants, including acorns (originally proposed by Rogers 1929; Gallegos 2002).

The Archaic Period in southern California is associated with a number of different cultures, complexes, traditions, horizons, and periods, including San Dieguito, La Jolla, Encinitas, Milling Stone, Pauma, and Intermediate.

Late Prehistoric Period (Late Holocene: 1,300 YBP to 1790)

Approximately 1,350 YBP, a Shoshonean-speaking group from the Great Basin region moved into San Bernardino County, marking the transition to the Late Prehistoric Period. This period has been characterized by higher population densities and elaborations in social, political, and technological systems. Economic systems diversified and intensified during this period, with the continued elaboration of trade networks, the use of shell-bead currency, and the appearance of more labor-intensive, yet effective, technological innovations. Technological developments during this period included the introduction of the bow and arrow between A.D. 400 and 600 and the introduction of ceramics. Atlatl darts were replaced by smaller arrow darts, including the Cottonwood series points. Other hallmarks of the Late Prehistoric Period include extensive trade networks as far reaching as the Colorado River Basin and cremation of the dead.

Protohistoric Period (Late Holocene: 1790 to Present)

Gabrielino

The territory of the Gabrielino at the time of Spanish contact covers much of present-day Los Angeles and Orange counties. The southern extent of this culture area is bounded by Aliso Creek, the eastern extent is located east of present-day San Bernardino along the Santa Ana River, the northern extent includes the San Fernando Valley, and the western extent includes portions of the Santa Monica Mountains. The Gabrielino also occupied several Channel Islands including Santa Barbara Island, Santa Catalina Island, San Nicholas Island, and San Clemente Island. Because of their access to certain resources, including a steatite source from Santa Catalina Island, this group was among the wealthiest and most populous aboriginal groups in all of southern California. Trade of materials and resources controlled by the Gabrielino extended as far north as the San Joaquin Valley, as far east as the Colorado River, and as far south as Baja California (Bean and Smith 1978a; Kroeber 1976).

The Gabrielino lived in permanent villages and smaller resource gathering camps occupied at various times of the year depending upon the seasonality of the resource. Larger villages were comprised of several families or clans, while smaller seasonal camps typically housed smaller family units. The coastal area between San Pedro and Topanga Canyon was the location of primary subsistence villages, while secondary sites were located near inland sage stands, oak groves, and pine forests. Permanent villages were located along rivers and streams, as well as in sheltered areas along the coast. As previously mentioned, the Channel Islands were also the locations of relatively large settlements (Bean and Smith 1978a; Kroeber 1976).

Resources procured along the coast and on the islands were primarily marine in nature and included tuna, swordfish, ray, shark, California sea lion, Stellar sea lion, harbor seal, northern elephant seal, sea otter, dolphin, porpoise, various waterfowl species, numerous fish species, purple sea urchin, and mollusks such as rock scallop, California mussel, and limpet. Inland resources included oak acorn, pine nut, Mohave yucca, cacti, sage, grass nut, deer, rabbit, hare, rodent, quail, duck, and a variety of reptiles such as western pond turtle and snakes (Bean and Smith 1978a; Kroeber 1976).

The social structure of the Gabrielino is little known; however, there appears to have been at least three social classes: 1) the elite, which included the rich, chiefs, and their immediate family; 2) a middle class, which included people of relatively high economic status or long-established lineages; and 3) a class of people that included most other individuals in the society. Villages were politically autonomous units comprised of several lineages. During times of the year when certain seasonal resources were available, the village would divide into lineage groups and move out to exploit them, returning to the village between forays (Bean and Smith 1978a; Kroeber 1976).

Each lineage had its own leader, with the village chief coming from the dominant lineage. Several villages might be allied under a paramount chief. Chiefly positions were of an ascribed status, most often passed to the eldest son. Chiefly duties included providing village cohesion, leading warfare and peace negotiations with other groups, collecting tribute from the village(s) under his jurisdiction, and arbitrating disputes within the village(s). The status of the chief was legitimized by his safekeeping of the sacred bundle, which was a representation of the link between the material and spiritual realms and the embodiment of power (Bean and Smith 1978a; Kroeber 1976).

Shamans were leaders in the spirit realm. The duties of the shaman included conducting healing and curing ceremonies, guarding the sacred bundle, locating lost items, identifying and collecting poisons for arrows, and making rain (Bean and Smith 1978a; Kroeber 1976).

Marriages were made between individuals of equal social status and, in the case of powerful lineages, marriages were arranged to establish political ties between the lineages (Bean and Smith 1978a; Kroeber 1976).

Men conducted the majority of the heavy labor, hunting, fishing, and trading with other groups. Women's duties included gathering and preparing plant and animal resources, and making baskets, pots, and clothing (Bean and Smith 1978a; Kroeber 1976).

Gabrielino houses were domed, circular structures made of thatched vegetation. Houses varied in size and could house from one to several families. Sweathouses (semicircular, earth-covered buildings) were public structures used in male social ceremonies. Other structures included menstrual huts and a ceremonial structure called a *yuvar*, an open-air structure built near the chief's house (Bean and Smith 1978a; Kroeber 1976).

Clothing was minimal. Men and children most often went naked, while women wore deerskin or bark aprons. In cold weather, deerskin, rabbit fur, or bird skin (with feathers intact) cloaks were worn. Island and coastal groups used sea otter fur for cloaks. In areas of rough terrain, yucca fiber sandals were worn. Women often used red ochre on their faces and skin for adornment or protection from the sun. Adornment items included feathers, fur, shells, and beads (Bean and Smith 1978a; Kroeber 1976).

Hunting implements included wood clubs, sinew-backed bows, slings, and throwing clubs. Maritime implements included rafts, harpoons, spears, hook and line, and nets. A variety of other tools included deer scapulae saws, bone and shell needles, bone awls, scrapers, bone or shell flakers, wedges, stone knives and drills, metates, mullers, manos, shell spoons, bark platters, and wood paddles and bowls. Baskets were made from rush, deer grass, and skunkbush. Baskets were fashioned for hoppers, plates, trays, and winnowers for leaching, straining, and gathering. Baskets were also used for storing, preparing, and serving food, and for keeping personal and ceremonial items (Bean and Smith 1978a; Kroeber 1976).

The Gabrielino had exclusive access to soapstone, or steatite, procured from Santa Catalina Island quarries. This highly prized material was used for making pipes, animal carvings, ritual objects, ornaments, and cooking utensils. The Gabrielino profited well from trading steatite since it was valued so much by groups throughout southern California (Bean and Smith 1978a; Kroeber 1976).

Serrano

Aboriginally, the Serrano occupied an area east of present-day Los Angeles. According to Bean and Smith (1978b), definitive boundaries are difficult to place for the Serrano due to their sociopolitical organization and a lack of reliable data:

> The Serrano were organized into autonomous localized lineages occupying definite, favored territories, but rarely claiming any territory far removed from the

> lineage's home base. Since the entire dialectical group was neither politically united nor amalgamated into supralineage groups, as many of their neighbors were, one must speak in terms of generalized areas of usage rather than pan-tribal holdings. (Strong [1929] in Bean and Smith 1978b)

However, researchers place the Serrano in the San Bernardino Mountains east of Cajon Pass and at the base of and north of the mountains near Victorville, east to Twentynine Palms, and south to the Yucaipa Valley (Bean and Smith 1978b). Serrano has been used broadly for languages in the Takic family including Serrano, Kitanemuk, Vanyume, and Tataviam.

The Serrano were part of "exogamous clans, which in turn were affiliated with one of two exogamous moieties, *tukʷutam* (Wildcat) and *wahiʔiam* (Coyote)" (Bean and Smith 1978b). According to Strong (1971), details such as number, structure, and function of the clans are unknown. Instead, he states that clans were not political, but were rather structured based upon "economic, marital, or ceremonial reciprocity, a pattern common throughout Southern California" (Bean and Smith 1978b). The Serrano formed alliances amongst their own clans and with Cahuilla, Chemehuevi, Gabrielino, and Cupeño clans (Bean and Smith 1978b). Clans were large, autonomous, political and landholding units formed patrilineally, with all males descending from a common male ancestor, including all wives and descendants of the males. However, even after marriage, women would still keep their original lineage, and would still participate in those ceremonies (Bean and Smith 1978b).

According to Bean and Smith (1978b), the cosmogony and cosmography of the Serrano are very similar to those of the Cahuilla:

> There are twin creator gods, a creation myth told in "epic poem" style, each local group having its own origin story, water babies whose crying foretells death, supernatural beings of various kinds and on various hierarchically arranged power-access levels, an Orpheus-like myth, mythical deer that no one can kill, and tales relating the adventures (and misadventures) of Coyote, a tragicomic trickster-transformer culture hero. (Bean [1962-1972] and Benedict [1924] in Bean and Smith 1978b)

The Serrano had a shaman, a person who acquired their powers through dreams, which were induced through ingestion of the hallucinogen datura. The shaman was mostly a curer/healer, using herbal remedies and "sucking out the disease-causing agents" (Bean and Smith 1978b).

Serrano village locations were typically located near water sources. Individual family dwellings were likely circular, domed structures. Daily household activities would either take place outside of the house out in the open, or under a ramada constructed of a thatched willow pole roof held up by four or more poles inserted into the ground. Families could consist of a husband, wife/wives, unmarried female children, married male children, the husband's parents, and/or widowed aunts and uncles. Rarely, an individual would occupy his own house, typically in the mountains. Serrano villages also included a large ceremonial house where the lineage leader would live, which served as the religious center for lineages or lineage-sets, granaries, and sweathouses (Bean and Smith 1978b).

The Serrano were primarily hunters and gatherers. Vegetal staples varied with locality. Acorns and piñon nuts were found in the foothills, and mesquite, yucca roots, cacti fruits, and piñon nuts were found in or near the desert regions. Diets were supplemented with other roots, bulbs, shoots, and seeds (Heizer 1978). Deer, mountain sheep, antelopes, rabbits, and other small rodents were among the principal food packages. Various game birds, especially quail, were also hunted. The bow and arrow was used for large game, while smaller game and birds were killed with curved throwing sticks, traps, and snares. Occasionally, game was hunted communally, often during mourning ceremonies (Benedict 1924; Drucker 1937; Heizer 1978). Earth ovens were used to cook meat, bones were boiled to extract marrow, and blood was either drunk cold or cooked to a thicker consistency and then eaten. Some meat and vegetables were sun-dried and stored. Food acquisition and processing required the manufacture of additional items such as knives, stone or bone scrapers, pottery trays and bowls, bone or horn spoons, and stirrers. Mortars, made of either stone or wood, and metates were also manufactured (Strong 1971; Drucker 1937; Benedict 1924).

The Serrano were very similar technologically to the Cahuilla. In general, manufactured goods included baskets, some pottery, rabbit-skin blankets, awls, arrow straighteners, sinew-backed bows, arrows, fire drills, stone pipes, musical instruments (rattles, rasps, whistles, bull-roarers, and flutes), feathered costumes, mats for floor and wall coverings, bags, storage pouches, cordage (usually comprised of yucca fiber), and nets (Heizer 1978).

1.3.2 Historic Period

The City of San Bernardino General Plan provides seven contexts to be used for the city, which “describe the defining historical events, which marked major, changes in the physical and cultural landscape of the City”: Prehistoric, Mission (1769-1822), Rancho (1822-1847), Anglo-Mexican (1851-1882), Euro-Americanization (1883-1916), Regional Culture (1917-1945), and (Postwar Suburbanization and Cold War (1946-present) (City of San Bernardino 2005). The first context, associated with the prehistoric period, is detailed above in Section 1.3.1, while the remainining six contexts associated with the historic development of the city and surrounding area are outlined below:

Mission (1769-1822)

The historic background of the project area began with the Spanish colonization of Alta California. The first Spanish colonizing expedition reached southern California in 1769 with the intention of converting and civilizing the indigenous populations, as well as expanding the knowledge of and access to new resources in the region (Brigandi 1998). In the late eighteenth century, the San Gabriel (Los Angeles County), San Juan Capistrano (Orange County), and San

Luis Rey (San Diego County) missions began colonizing southern California, and gradually expanded their use of the interior valley (presently western Riverside County) for raising grain and cattle to support the missions. The San Gabriel Mission claimed lands in what is presently Jurupa, Riverside, San Jacinto, and the San Gorgonio Pass, while the San Luis Rey Mission claimed land in what is presently Lake Elsinore, Temecula, and Murrieta (American Local History Network: Riverside County, California 1998). The indigenous groups who occupied these lands were recruited by missionaries, converted, and put to work in the missions (Pourade 1964). Throughout this period, the Native American populations were decimated by introduced diseases, a drastic shift in diet resulting in poor nutrition, and social conflicts due to the introduction of an entirely new social order (Cook 1976).

Native Californians may have first coalesced with Europeans around 1769 when the first Spanish mission was established in San Diego. In 1771, Friar Francisco Graces first searched the Californian desert for potential mission sites. Interactions between local tribes and Franciscan priests definitely occurred by 1774 when Juan Bautista De Anza made an exploration of Alta California.

Serrano contact with the Europeans may have occurred as early as 1771 or 1772, but it was not until approximately 1819 that the Spanish directly influenced the culture. The Spanish established asistencias in San Bernardino, Pala, and Santa Ysabel. Between the founding of the asistencia and secularization in 1834, most of the Serranos in the San Bernardino Mountains were removed to the nearby missions (Beattie and Beattie 1951:366) while the Cahuilla maintained a high level of autonomy from Spain (Bean 1978).

Spain encouraged settlement in California by issuing a number of land grants, which provided individuals the right to use Spanish-owned property. The first Spanish land grant was issued to Juan José Domínguez in 1784. In total, Spain issued 22 land grants between the years of 1784 to 1821. When Mexico gained independence, the Mexican government gained control of Baja and Alta California. The Mexican government reclaimed the land Spain granted to the missions and continued to issue land grants to individuals.

While no missions were ever built in what would become San Bernardino County, many mission outposts, or asistencias, were established in the early years of the nineteenth century to extend the missions' influence to the backcountry (Brigandi 1998). The first documented Spanish settlement within present-day San Bernardino County was established in 1810. The exact location of this settlement is unknown, but was likely to have been near the confluence of Lytle Creek, Warm Creek, and the Santa Ana River, within the current San Bernardino city limits (City of San Bernardino 2005).

Rancho (1822-1847)

Mexico gained independence in 1822 and desecularized the missions in 1832, signifying the end of the Mission Period (Brigandi 1998; Riverside County n.d.). By this time, the missions owned some of the best and most fertile land in southern California. In order for California to develop, the land would have to be made productive enough to turn a profit (Brigandi 1998). The new government began distributing the vast mission holdings to wealthy and politically connected Mexican citizens. The "grants" were called "ranchos," and many of these ranchos have lent their names to modern-day locales (American Local History Network: Riverside County, California 1998). The treatment of Native Americans grew worse during the Rancho Period. Most of the Native Americans were forced off of their land or put to work on the privately owned ranchos, most often as slave labor. In light of the brutal ranchos, the degree to which Native Americans had become dependent upon the mission system becomes evident when, in 1838, a group of Native Americans from the San Luis Rey mission petitioned government officials in San Diego to relieve suffering at the hands of the rancheros:

> We have suffered incalculable losses, for some of which we are in part to be blamed for because many of us have abandoned the Mission … We plead and beseech you … to grant us a Rev. Father for this place. We have been accustomed to the Rev. Fathers and to their manner of managing the duties. We labored under their intelligent directions, and we were obedient to the Fathers according to the regulations, because we considered it as good for us. (Brigandi 1998:21)

Native American culture had been disrupted to the point where they could no longer rely upon prehistoric subsistence and social patterns. Not only does this illustrate how dependent the Native Americans had become upon the missionaries, but it also indicates a marked contrast in the way the Spanish treated the Native Americans as compared to the Mexican and United States ranchers. Spanish colonialism (missions) is based upon utilizing human resources while integrating them into their society. The ranchers, both Mexican and American, did not accept Native Americans into their social order and used them specifically for the extraction of labor, resources, and profit. Rather than being incorporated, they were either subjugated or exterminated (Cook 1976).

Originally, the 35,509 acres of land that comprised Rancho San Bernardino was created by Mission San Gabriel in 1819. Like most of the ranchos, it was used for agriculture and cattle raising, which was facilitated by the construction of the Mill Creek Zanja (water ditch). Completed in 1820, the Mill Creek Zanja extended from Mill Creek (called Mission Creek at that time) to the asistencia. After Spain relinquished control of the Alto and Baja California in 1821, the missions became secularized, and by 1834, the missions were closed. The former mission lands started to be granted to wealthy private citizens, often through political and familial connections (San Bernardino History and Railroad Museum 2010).

Don Antonio Maria Lugo, a wealthy landowner in Los Angeles, requested the land grant in San Bernardino for his three sons and nephew: José del Cármen Lugo, Vincente Lugo, José Maria Lugo, and Diego Sepúlveda (San Bernardino County Historical Archives 2012). It was granted by the governor, Juan Bautista Alvarado, Don Lugo's grandnephew, on June 21, 1842.

The three Lugos and their cousin built homes on the land and raised cattle, but they eventually sold it off to the Mormon church in 1851 (Haenszel 1984).

Anglo-Mexican (1851-1882)

In 1846, war erupted between Mexico and the United States. In 1848, with the signing of the Treaty of Guadalupe Hidalgo, the region was annexed as a territory of the United States, and in 1850, California became a state. These events generated a steady flow of settlers into the area, including gold miners, entrepreneurs, health-seekers, speculators, politicians, adventurers, seekers of religious freedom, and individuals desiring to create utopian colonies. As the non-native population increased through immigration, the indigenous population rapidly declined from the high morbidity of European diseases, low birth rates, and conflict and violence. California became a state in 1850 and was divided into 21 counties. The dwindling native populations were eventually displaced into reservations after California became a state.

At the time the Mormons purchased Don Lugo's land, the exact boundaries of the rancho had not been established, and many non-Mormons were living on portions of the land grant. When the boundaries were determined, the Mormons claimed land occupied by Jerome Benson. Benson refused to move and was joined by several other people in the same predicament. In response, Benson's adobe barn was fortified with a cannon and dubbed "Fort Benson." Ultimately, the fort was never attacked, nor was anyone forced off their land. Later, in 1852, two Mormon brothers, Amasa Lyman and Charles Rich, established a new urban settlement, which would later become the city of San Bernardino. The San Bernardino townsite was surveyed in 1853 by Henry G. Sherwood and officially incorporated in 1854. At that time, two thirds of the population was Mormon. The large Mormon presence in San Bernardino would be short-lived, however, as in 1857, Brigham Young recalled all Mormons in San Bernardino back to Utah. Approximately half returned to Utah, while the other half remained in San Bernardino, choosing "to forsake the church rather than leave their homes" (Lyman 1989).

Euro-Americanization (1883-1916)

In 1883, when the Atchison, Topeka, and Santa Fe (AT&SF) Railroad wanted to construct their major facilities within San Bernardino, the city agreed. With the AT&SF as an important growth engine for the area, the greater San Bernardino region thrived with citrus, grape, and steel industries. By 1891, San Bernardino had established itself as a cosmopolitan settlement. The population had reached 5,000, the city had 26 miles of paved streets, an opera house, and the citizenry enjoyed other entertainments such as literary circles (LaFuze 1971).

By the late 1880s and early 1890s, there was growing discontent between San Bernardino and Riverside, its neighbor 10 miles to the south, due to differences in opinion concerning religion, morality, the Civil War, politics, and fierce competition to attract settlers. After a series of instances in which charges were claimed about unfair use of tax monies to the benefit of only the city of San Bernardino, several people from Riverside decided to investigate the possibility of a new county. In May of 1893, voters living within portions of San Bernardino County (to the north) and San Diego County (to the south) approved the formation of Riverside County. Early business opportunities were linked to the agriculture industry but commerce, construction, manufacturing, transportation, and tourism also provided a healthy local economy. However, the AT&SF Railroad by far had the largest impact on the economy of San Bernardino, and by 1900, the railroad employed more than 85 percent of the population (City of San Bernardino 2005).

Between 1900 and 1910, the city's population more than doubled from 6,150 to 12,799, necessitating the construction of a City Hall, public library, and high school (City of San Bernardino 2005). In 1910, the San Bernardino Chamber of Commerce was established (City of San Bernardino 2005).

Regional Culture (1917-1945)

San Bernardino's population continued to rise, and as a result, development expanded outward from the city's center core to include department stores, theaters, additional schools, a courthouse, and San Bernardino College. The city's rapid expansion slowed during the Depression era of the 1930s, with the exception of a few public buildings constructed utilizing Works Progress Administration funding, including a Department of Public Health, a fire department, and the San Bernardino Cultural Center (City of San Bernardino 2005). Despite the slowed growth, a wave of migrants from Oklahoma and Arkansas arrived in San Bernardino to work in the agricultural fields in and around the city limits.

The advent of World War II ushered in a time of economic prosperity for the city and surrounding area. In 1941, Yucaipa representative Harry Sheppard and San Bernardino County Supervisor Gene Grier joined forces to lobby for a supply depot and military base near San Bernardino (Cataldo 2019). Construction on the San Bernardino Army Air Depot began the following year. Over 50 additional buildings throughout the county were leased to the military for use as storage and office space (Cataldo 2019). The military base rapidly replaced the AT&SF Railroad as the city's leading economic contributor (City of San Bernardino 2005). Furthermore, Kaiser Steel was founded in nearby Fontana in the 1940s and became one of the main producers of steel west of the Mississippi River. The Kaiser Steel Mill was built in response to the United States government's need for a steel mill and factory on the west coast to construct boats and airplanes following the bombing of Pearl Harbor in 1941 (Sturm et al. 1995).

Postwar Suburbanization and Cold War (1946-present)

After the conclusion of World War II, many military families decided to remain in the Inland Empire after their service ended, causing the city's population to continue to rise. As a result, San Bernardino's economic growth continued, with suburban development rapidly replacing former agricultural land. In 1950, San Bernardino Air Depot was renamed Norton Air Force Base (AFB), in honor of Captain Leland F. Norton, a local resident who was killed in action during World War II (Cataldo 2019). Norton AFB provided continued support to the military throughout and beyond the Cold War, expanding to provide maintenance, storage, and logistics services for missile programs. In 1966, Norton AFB was selected to house the 63rd Military Airlift wing and the Aerospace Audiovisual Services headquarters (City of San Bernardino 2005). Only in the 1970s did the region's growth begin to falter with the demise of citrus and steel production and lessening demand for railroad transportation. While this trend has affected the historic core of downtown San Bernardino, residents have recently begun to return to the area as a result of redevelopment efforts.

1.4 Results of the Archaeological Records Search

An archaeological records search for the project and the surrounding area within a one-half mile radius was requested from the SCCIC at CSU Fullerton on June 14, 2021. However, due to the limitations imposed by the evolving circumstances related to the COVID-19 pandemic, records search access has become limited, and the results are delayed for the foreseeable future. As such, no records search data was available at the time of the completion of this report. An updated report will be provided to the City of San Bernardino once such data is available.

BFSA reviewed the following sources to help facilitate a better understanding of the historic use of the property:

- The National Register of Historic Places index
- Office of Historic Preservation Built Environment Resources Directory
- Historic USGS data
- Historic aerial photographs (1938, 1959, 1966, 1968, 1980, and 1994)

None of these additional sources identified any potential resources within the subject property. The 1938 aerial photograph shows the project as part of the Lytle Creek flood plain. By 1959, the highway that would eventually become I-215 and a highway on-ramp had been constructed immediately west of the project, Lytle Creek had been channelized, and a structure with a small parking lot was situated within the southwest corner of the property. A review of the various versions of the *San Bernardino South* 7.5' quadrangle shows that sometime between 1954 and 1967, two radio towers were constructed within the project. Subsequent aerial photographs show little change to the project; however, the 1968 photograph shows an additional building constructed just outside of the southwestern portion of the property at 780 West Mill Street, while two large buildings appear just next to the southeastern corner of the property between the 1968 and 1980 aerials. By the 1994 aerial photograph, the structure originally located in the southwestern corner of the project had been removed from the subject property.

BFSA also requested a records search of the NAHC SLF. As of the date of this report, the NAHC SLF search results have not been returned. All correspondence is provided in Appendix C.

1.5 Applicable Regulations

Resource importance is assigned to districts, sites, buildings, structures, and objects that possess exceptional value or quality illustrating or interpreting the heritage of San Bernardino County in history, architecture, archaeology, engineering, and culture. A number of criteria are used in demonstrating resource importance. Specifically, the criteria outlined in CEQA and the City of San Bernardino environmental guidelines. The following sections detail the criteria that a resource must meet in order to be determined important.

1.5.1 California Environmental Quality Act

According to CEQA (§15064.5a), the term "historical resource" includes the following:

1) A resource listed in or determined to be eligible by the State Historical Resources Commission for listing in the California Register of Historical Resources (CRHR) (Public Resources Code SS5024.1, Title 14 CCR. Section 4850 et seq.).
2) A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
3) Any object, building, structure, site, area, place, record, or manuscript, which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the CRHR (Public Resources Code SS5024.1, Title 14, Section 4852) including the following:

    a) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
    b) Is associated with the lives of persons important in our past;
    c) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
    d) Has yielded, or may be likely to yield, information important in prehistory or history.

4) The fact that a resource is not listed in, or determined eligible for listing in the CRHR,

> not included in a local register of historical resources (pursuant to Section 5020.1[k] of the Public Resources Code), or identified in an historical resources survey (meeting the criteria in Section 5024.1[g] of the Public Resources Code) does not preclude a lead agency from determining that the resource may be an historical resource as defined in Public Resources Code Section 5020.1(j) or 5024.1.

According to CEQA (§15064.5b), a project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. CEQA defines a substantial adverse change as:

1) Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.
2) The significance of an historical resource is materially impaired when a project:

    a) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in the CRHR; or
    b) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to Section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or,
    c) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR as determined by a lead agency for purposes of CEQA.

Section 15064.5(c) of CEQA applies to effects on archaeological sites and contains the following additional provisions regarding archaeological sites:

1. When a project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource, as defined in subsection (a).
2. If a lead agency determines that the archaeological site is an historical resource, it shall refer to the provisions of Section 21084.1 of the Public Resources Code, Section 15126.4 of the guidelines, and the limits contained in Section 21083.2 of the Public

Resources Code do not apply.

3. If an archaeological site does not meet the criteria defined in subsection (a), but does meet the definition of a unique archaeological resource in Section 21803.2 of the Public Resources Code, the site shall be treated in accordance with the provisions of Section 21083.2. The time and cost limitations described in Public Resources Code Section 21083.2 (c-f) do not apply to surveys and site evaluation activities intended to determine whether the project location contains unique archaeological resources.
4. If an archaeological resource is neither a unique archaeological nor historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment. It shall be sufficient that both the resource and the effect on it are noted in the Initial Study or Environmental Impact Report, if one is prepared to address impacts on other resources, but they need not be considered further in the CEQA process.

Section 15064.5 (d) and (e) contain additional provisions regarding human remains. Regarding Native American human remains, paragraph (d) provides:

(d) When an initial study identifies the existence of, or the probable likelihood of, Native American human remains within the project, a lead agency shall work with the appropriate Native Americans as identified by the NAHC as provided in Public Resources Code SS5097.98. The applicant may develop an agreement for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American burials with the appropriate Native Americans as identified by the NAHC. Action implementing such an agreement is exempt from:

1) The general prohibition on disinterring, disturbing, or removing human remains from any location other than a dedicated cemetery (Health and Safety Code Section 7050.5).
2) The requirements of CEQA and the Coastal Act.

2.0 RESEARCH DESIGN

The primary goal of the research design is to attempt to understand the way in which humans have used the land and resources within the project through time, as well as to aid in the determination of resource significance. For the current project, the study area under investigation is southwestern San Bernardino County. The scope of work for the cultural resources study conducted for the 776 West Mill Street Project included the survey of a 7.08-acre area. Given the area involved and the recorded presence of nearby archaeological sites, the research design for this project was focused upon realistic study options. Since the main objective of the investigation was to identify the presence of and potential impacts to cultural resources, the goal here is not necessarily to answer wide-reaching theories regarding the development of early southern California, but to investigate the role and importance of identified resources. Nevertheless, the assessment of the significance of a resource must take into consideration a variety of characteristics, as well as the ability of a resource to address regional research topics and issues.

Although elementary resource evaluation programs are limited in terms of the amount of information available, several specific research questions were developed that could be used to guide the initial investigations of any observed cultural resources. The following research questions take into account the small size and location of the project discussed above.

Research Questions:

- Can located cultural resources be associated with a specific time period, population, or individual?
- Do the types of any located cultural resources allow a site activity/function to be determined from a preliminary investigation? What are the site activities? What is the site function? What resources were exploited?
- How do located sites compare to others reported from different surveys conducted in the area?
- How do located sites fit existing models of settlement and subsistence for valley environments of the region?

Data Needs

At the survey level, the principal research objective is a generalized investigation of changing settlement patterns in both the prehistoric and historic periods within the study area. The overall goal is to understand settlement and resource procurement patterns of the project occupants. Therefore, adequate information on site function, context, and chronology from an archaeological perspective is essential for the investigation. The fieldwork and archival research were undertaken with the following primary research goals in mind:

1) To identify cultural resources occurring within the project;

2) To determine, if possible, site type and function, context of the resource(s), and chronological placement of each cultural resource identified;
3) To place each cultural resource identified within a regional perspective; and
4) To provide recommendations for the treatment of each cultural resources identified.

3.0 ANALYSIS OF PROJECT EFFECTS

The cultural resources study of the project consisted of an institutional records search, an intensive cultural resource survey of the entire 7.08-acre project, and the preparation of this technical report. This study was conducted in conformance with City of San Bernardino environmental guidelines, Section 21083.2 of the California Public Resources Code, and CEQA. Statutory requirements of CEQA (Section 15064.5) were followed for the identification and evaluation of resources. Specific definitions for archaeological resource type(s) used in this report are those established by the State Historic Preservation Office (SHPO 1995).

3.1 Survey Methods

The survey methodology employed during the current investigation followed standard archaeological field procedures and was sufficient to accomplish a thorough assessment of the project. The field methodology employed for the project included walking evenly spaced survey transects set approximately 10 meters apart while visually inspecting the ground surface. All potentially sensitive areas where cultural resources might be located were closely inspected. Photographs documenting survey areas and overall survey conditions were taken frequently.

3.2 Results of the Field Survey

Staff archaeologist David Grabski conducted the archaeological survey for the 776 West Mill Street Project on June 10, 2021. The archaeological survey of the property was an intensive reconnaissance consisting of a series of parallel survey transects spaced at approximately 10-meter intervals. The entire property was accessible although ground visibility was moderate due to some pockets of dense vegetation. Vegetation on the property primarily consisted of non-native weeds and grasses with trees primarily consisting of palm and eucalyptus situated along the periphery of the project (Plate 3.2–1 and Plate 3.2–2).

Plate 3.2–1: Overview of the project, facing north.

Plate 3.2–2: Overview of the project, facing south.

The property appears to have been partially impacted by the previous developments that have taken place adjacent to the project. Evidence of earthwork, primarily situated along the northwestern and northeastern boundary, adjacent to the I-215 entrance alignment and channelized East Branch of Lytle Creek, was noted. Further, within the southwestern portion of the project, it appears the parking lot for the larger adjacent buildings first identified on the 1980 aerial photograph has been extended into the current project parcels (Plate 3.2–3). The two radio towers were also identified on the property. However, despite first appearing on the 1967 map, it is obvious they have been maintained and replaced, are still in service, and comprised entirely of modern materials and therefore do not contain any historic elements (Plate 3.2–4). As such, they are not eligible for evaluation for inclusion in the CRHR and the survey did not identify any historic or prehistoric resources.

Plate 3.2–3: Overview of the project and adjacent parking lot, facing southwest.

Plate 3.2–4: Overview of the radio towers on the property, facing west.

4.0 RECOMMENDATIONS

The Phase I archaeological assessment for the 776 West Mill Street Project was negative for the presence of significant cultural resources. However, the property is located adjacent to a natural water source, Lytle Creek, which would have been an advantageous feature exploited by the prehistoric and historic inhabitants of the region. As identified on the 1959 aerial photograph, the subject property historically contained a structure in the southwestern corner. Further, as noted during the survey, the property appears to have been impacted by the neighboring improvements such as the I-215 alignment and channelization of the East Branch of Lytle Creek, which occurred prior to CEQA environmental regulations. As such, the status of the property appears to have affected the potential to discover any evidence of archaeological sites. If archaeological materials exist at the subject property but have been masked or buried by past earthwork, grading of the project will expose such buried resources. Therefore, a cultural resources monitoring program is recommended during grading of the property. The scope of the cultural resources Mitigation Monitoring and Reporting Program (MMRP) is presented in Section 4.1.

4.1 Mitigation Monitoring and Reporting Program

The proposed development of the 776 West Mill Street property may encounter unrecorded cultural deposits or features. To mitigate for potential impacts to inadvertent discoveries, a MMRP is recommended as a condition of approval. The MMRP is provided below:

General Procedures and Protocols to Be Implemented During Construction Monitoring

During Grading

A. Monitor(s) Shall Be Present During Grading/Excavation/Trenching
   1. The archaeological monitor shall be present full-time during all soil-disturbing and grading/excavation/trenching activities that could result in impacts to archaeological resources.
   2. The principal investigator (PI) may submit a detailed letter to the lead agency during construction requesting a modification to the monitoring program when a field condition such as modern disturbance post-dating previous grading/trenching activities, presence of fossil formations, or native soils is encountered that may reduce or increase the potential for resources to be present.

B. Discovery Notification Process
   1. In the event of an archaeological discovery, either historic or prehistoric, the archaeological monitor shall direct the contractor to temporarily divert all soil-disturbing activities, including but not limited to, digging, trenching, excavating, or grading activities in the area of discovery and in the area reasonably suspected to overlay adjacent resources, and immediately notify the Native American monitor

   and client, as appropriate.
  2. The monitor shall immediately notify the PI (unless monitor is the PI) of the discovery.

C. Determination of Significance
  1. The PI shall evaluate the significance of the resource. If human remains are involved, follow protocol in Section D, below.

     a. The PI shall immediately notify the City to discuss significance determination and shall also submit a letter indicating whether additional mitigation is required.
     b. If the resource is significant, the PI shall submit an Archaeological Data Recovery Program (ADRP) that has also been reviewed by the Native American consultant/monitor, and obtain written approval from the City to implement that program. Impacts to significant resources must be mitigated before ground-disturbing activities in the area of discovery will be allowed to resume.
     c. If the resource is not significant, the PI shall submit a letter to the City indicating that artifacts will be collected, curated, and documented in the final monitoring report. The letter shall also indicate that no further work is required.

D. Discovery of Human Remains
   If human remains are discovered, work shall halt in that area until a determination can be made regarding the provenance of the human remains, and the following procedures as set forth in CEQA Section 15064.5(e), the California Public Resources Code (Sec. 5097.98), and the State Health and Safety Code (Sec. 7050.5) shall be undertaken:

   I. Notification
      1. The archaeological monitor shall notify the PI, if the monitor is not qualified as a PI.
      2. The PI shall notify the medical examiner after consultation with the City, either in person or via telephone.

   II. Isolate discovery site
      1. Work shall be directed away from the location of the discovery and any nearby area reasonably suspected to overlay adjacent human remains until a determination can be made by the medical examiner in consultation with the PI concerning the provenance of the remains.
      2. The medical examiner, in consultation with the PI, will determine the need for a field examination to determine the provenance.

3. If a field examination is not warranted, the medical examiner will determine, with input from the PI, if the remains are or are most likely to be of Native American origin.

III. If human remains **ARE** determined to be Native American

1. The medical examiner will notify the NAHC within 24 hours. By law, **ONLY** the medical examiner can make this call.
2. The NAHC will immediately identify the person or persons determined to be the Most Likely Descendent (MLD) and provide contact information.
3. The MLD will contact the PI within 24 hours or sooner after the medical examiner has completed coordination to begin the consultation process in accordance with CEQA Section 15064.5(e), the California Public Resources, and the State Health and Safety Code.
4. The MLD will have 48 hours to make recommendations to the property owner or representative for the treatment or disposition with proper dignity of the human remains and associated grave goods.
5. Disposition of Native American human remains will be determined between the MLD and the PI, and, if:

    a. The NAHC is unable to identify the MLD, OR the MLD failed to make a recommendation within 48 hours after being notified by the NAHC; OR
    b. The landowner or authorized representative rejects the recommendation of the MLD and mediation in accordance with Public Resources Code 5097.94 (k) by the NAHC fails to provide measures acceptable to the landowner; THEN
    c. Upon the discovery of multiple Native American human remains during a ground-disturbing land development activity, the landowner may agree that additional conferral with descendants is necessary to consider culturally appropriate treatment of multiple Native American human remains. Culturally appropriate treatment of such a discovery may be ascertained from review of the site utilizing cultural and archaeological standards. Where the parties are unable to agree upon the appropriate treatment measures, the human remains and grave goods buried with the Native American human remains shall be reinterred with appropriate dignity.

IV. If human remains are **NOT** Native American

1. The PI shall contact the medical examiner and notify them of the historic-

era context of the burial.

2. The medical examiner will determine the appropriate course of action with the PI and city staff (Public Resources Code 5097.98).
3. If the remains are of historic origin, they shall be appropriately removed and conveyed to the City. The decision for internment of the human remains shall be made in consultation with the City, the applicant/landowner, and any known descendant group.

<u>Post-Construction</u>

A. Preparation and Submittal of Draft Monitoring Report
   1. The PI shall submit to the City a draft monitoring report (even if negative) prepared in accordance with the agency guidelines, which describes the results, analysis, and conclusions of all phases of the archaeological monitoring program (with appropriate graphics).

      a. For significant archaeological resources encountered during monitoring, the ADRP shall be included in the draft monitoring report.
      b. Recording sites with the State of California Department of Parks and Recreation (DPR) shall be the responsibility of the PI, including recording (on the appropriate forms-DPR 523 A/B) any significant or potentially significant resources encountered during the archaeological monitoring program.

   2. The PI shall submit a revised draft monitoring report to the City for approval, including any changes or clarifications requested by the City.

B. Handling of Artifacts
   1. The PI shall be responsible for ensuring that all cultural remains collected are cleaned and cataloged.
   2. The PI shall be responsible for ensuring that all artifacts are analyzed to identify function and chronology as they relate to the history of the area; that faunal material is identified as to species; and that specialty studies are completed, as appropriate.
   3. The cost for curation is the responsibility of the property owner.

C. Curation of Artifacts
   1. To be determined.

D. Final Monitoring Report(s)
   1. The PI shall submit the approved final monitoring report to the City and any interested parties.

5.0 LIST OF PREPARERS AND ORGANIZATIONS CONTACTED

The archaeological survey program for the 776 West Mill Project was directed by Principal Investigator Brian F. Smith. The archaeological fieldwork was conducted by staff archaeologist David Grabski. The report text was prepared by Andrew J. Garrison and Brian F. Smith. Report graphics were provided by Andrew J. Garrison. Technical editing and report production were conducted by Summer Forsman with assistance from Elena Goralogia. The archaeological records search was requested from the SCCIC at CSU Fullerton. BFSA also requested the NAHC SLF records search.

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APPENDIX A

Resumes of Key Personnel

Brian F. Smith, MA

Owner, Principal Investigator

Brian F. Smith and Associates, Inc.
14010 Poway Road • Suite A •
Phone: (858) 679-8218 • Fax: (858) 679-9896 • E-Mail: bsmith@bfsa-ca.com

Education

Master of Arts, History, University of San Diego, California **1982**

Bachelor of Arts, History, and Anthropology, University of San Diego, California **1975**

Professional Memberships

Society for California Archaeology

Experience

Principal Investigator **1977–Present**
Brian F. Smith and Associates, Inc. **Poway, California**

Brian F. Smith is the owner and principal historical and archaeological consultant for Brian F. Smith and Associates. Over the past 32 years, he has conducted over 2,500 cultural resource studies in California, Arizona, Nevada, Montana, and Texas. These studies include every possible aspect of archaeology from literature searches and large-scale surveys to intensive data recovery excavations. Reports prepared by Mr. Smith have been submitted to all facets of local, state, and federal review agencies, including the US Army Corps of Engineers, the Bureau of Land Management, the Bureau of Reclamation, the Department of Defense, and the Department of Homeland Security. In addition, Mr. Smith has conducted studies for utility companies (Sempra Energy) and state highway departments (CalTrans).

Professional Accomplishments

These selected major professional accomplishments represent research efforts that have added significantly to the body of knowledge concerning the prehistoric life ways of cultures once present in the Southern California area and historic settlement since the late 18th century. Mr. Smith has been principal investigator on the following select projects, except where noted.

Downtown San Diego Mitigation and Monitoring Reporting Programs: Large numbers of downtown San Diego mitigation and monitoring projects, some of which included Broadway Block (2019), 915 Grape Street (2019), 1919 Pacific Highway (2018), Moxy Hotel (2018), Makers Quarter Block D (2017), Ballpark Village (2017), 460 16th Street (2017), Kettner and Ash (2017), Bayside Fire Station (2017), Pinnacle on the Park (2017), IDEA1 (2016), Blue Sky San Diego (2016), Pacific Gate (2016), Pendry Hotel (2015), Cisterra Sempra Office Tower (2014), 15th and Island (2014), Park and G (2014), Comm 22 (2014), 7th and F Street Parking (2013), Ariel Suites (2013), 13th and Marker (2012), Strata (2008), Hotel Indigo (2008), Lofts at 707 10th Avenue Project (2007), Breeza (2007), Bayside at the Embarcadero (2007), Aria (2007), Icon (2007), Vantage Pointe (2007), Aperture (2007), Sapphire Tower (2007), Lofts at 655 Sixth Avenue (2007), Metrowork (2007), The Legend (2006), The Mark (2006), Smart Corner (2006), Lofts at 677 7th Avenue (2005), Aloft on Cortez Hill (2005), Front and Beech Apartments (2003), Bella Via Condominiums (2003), Acqua Vista Residential Tower (2003), Northblock Lofts (2003), Westin Park Place Hotel (2001), Parkloft

Apartment Complex (2001), Renaissance Park (2001), and Laurel Bay Apartments (2001).

1900 and 1912 Spindrift Drive: An extensive data recovery and mitigation monitoring program at the Spindrift Site, an important prehistoric archaeological habitation site stretching across the La Jolla area. The project resulted in the discovery of over 20,000 artifacts and nearly 100,000 grams of bulk faunal remains and marine shell, indicating a substantial occupation area (2013-2014).

San Diego Airport Development Project: An extensive historic assessment of multiple buildings at the San Diego International Airport and included the preparation of Historic American Buildings Survey documentation to preserve significant elements of the airport prior to demolition (2017-2018).

Citracado Parkway Extension: A still-ongoing project in the city of Escondido to mitigate impacts to an important archaeological occupation site. Various archaeological studies have been conducted by BFSA resulting in the identification of a significant cultural deposit within the project area.

Westin Hotel and Timeshare (Grand Pacific Resorts): Data recovery and mitigation monitoring program in the city of Carlsbad consisted of the excavation of 176 one-square-meter archaeological data recovery units which produced thousands of prehistoric artifacts and ecofacts, and resulted in the preservation of a significant prehistoric habitation site. The artifacts recovered from the site presented important new data about the prehistory of the region and Native American occupation in the area (2017).

The Everly Subdivision Project: Data recovery and mitigation monitoring program in the city of El Cajon resulted in the identification of a significant prehistoric occupation site from both the Late Prehistoric and Archaic Periods, as well as producing historic artifacts that correspond to the use of the property since 1886. The project produced an unprecedented quantity of artifacts in comparison to the area encompassed by the site, but lacked characteristics that typically reflect intense occupation, indicating that the site was used intensively for food processing (2014-2015).

Ballpark Village: A mitigation and monitoring program within three city blocks in the East Village area of San Diego resulting in the discovery of a significant historic deposit. Nearly 5,000 historic artifacts and over 500,000 grams of bulk historic building fragments, food waste, and other materials representing an occupation period between 1880 and 1917 were recovered (2015-2017).

Archaeology at the Padres Ballpark: Involved the analysis of historic resources within a seven-block area of the "East Village" area of San Diego, where occupation spanned a period from the 1870s to the 1940s. Over a period of two years, BFSA recovered over 200,000 artifacts and hundreds of pounds of metal, construction debris, unidentified broken glass, and wood. Collectively, the Ballpark Project and the other downtown mitigation and monitoring projects represent the largest historical archaeological program anywhere in the country in the past decade (2000-2007).

4S Ranch Archaeological and Historical Cultural Resources Study: Data recovery program consisted of the excavation of over 2,000 square meters of archaeological deposits that produced over one million artifacts, containing primarily prehistoric materials. The archaeological program at 4S Ranch is the largest archaeological study ever undertaken in the San Diego County area and has produced data that has exceeded expectations regarding the resolution of long-standing research questions and regional prehistoric settlement patterns.

Charles H. Brown Site: Attracted international attention to the discovery of evidence of the antiquity of man in North America. Site located in Mission Valley, in the city of San Diego.

Del Mar Man Site: Study of the now famous Early Man Site in Del Mar, California, for the San Diego Science Foundation and the San Diego Museum of Man, under the direction of Dr. Spencer Rogers and Dr. James R. Moriarty.

Old Town State Park Projects: Consulting Historical Archaeologist. Projects completed in the Old Town State Park involved development of individual lots for commercial enterprises. The projects completed in Old Town include Archaeological and Historical Site Assessment for the Great Wall Cafe (1992), Archaeological Study for the Old Town Commercial Project (1991), and Cultural Resources Site Survey at the Old San Diego Inn (1988).

Site W-20, Del Mar, California: A two-year-long investigation of a major prehistoric site in the Del Mar area of the city of San Diego. This research effort documented the earliest practice of religious/ceremonial activities in San Diego County (circa 6,000 years ago), facilitated the projection of major non-material aspects of the La Jolla Complex, and revealed the pattern of civilization at this site over a continuous period of 5,000 years. The report for the investigation included over 600 pages, with nearly 500,000 words of text, illustrations, maps, and photographs documenting this major study.

City of San Diego Reclaimed Water Distribution System: A cultural resource study of nearly 400 miles of pipeline in the city and county of San Diego.

Master Environmental Assessment Project, City of Poway: Conducted for the City of Poway to produce a complete inventory of all recorded historic and prehistoric properties within the city. The information was used in conjunction with the City's General Plan Update to produce a map matrix of the city showing areas of high, moderate, and low potential for the presence of cultural resources. The effort also included the development of the City's Cultural Resource Guidelines, which were adopted as City policy.

Draft of the City of Carlsbad Historical and Archaeological Guidelines: Contracted by the City of Carlsbad to produce the draft of the City's historical and archaeological guidelines for use by the Planning Department of the City.

The Mid-Bayfront Project for the City of Chula Vista: Involved a large expanse of undeveloped agricultural land situated between the railroad and San Diego Bay in the northwestern portion of the city. The study included the analysis of some potentially historic features and numerous prehistoric

Cultural Resources Survey and Test of Sites Within the Proposed Development of the Audie Murphy Ranch, Riverside County, California: Project manager/director of the investigation of 1,113.4 acres and 43 sites, both prehistoric and historic—included project coordination; direction of field crews; evaluation of sites for significance based on County of Riverside and CEQA guidelines; assessment of cupule, pictograph, and rock shelter sites, co-authoring of cultural resources project report. February- September 2002.

Cultural Resources Evaluation of Sites Within the Proposed Development of the Otay Ranch Village 13 Project, San Diego County, California: Project manager/director of the investigation of 1,947 acres and 76 sites, both prehistoric and historic—included project coordination and budgeting; direction of field crews; assessment of sites for significance based on County of San Diego and CEQA guidelines; co-authoring of cultural resources project report. May-November 2002.

Cultural Resources Survey for the Remote Video Surveillance Project, El Centro Sector, Imperial County: Project manager/director for a survey of 29 individual sites near the U.S./Mexico Border for proposed video surveillance camera locations associated with the San Diego Border barrier Project—project coordination and budgeting; direction of field crews; site identification and recordation; assessment of potential impacts to cultural resources; meeting and coordinating with U.S. Army Corps of Engineers, U.S. Border Patrol, and other government agencies involved; co-authoring of cultural resources project report. January, February, and July 2002.

Cultural Resources Survey and Test of Sites Within the Proposed Development of the Menifee West GPA, Riverside County, California: Project manager/director of the investigation of nine sites, both prehistoric and historic—included project coordination and budgeting; direction of field crews; assessment of sites for significance based on County of Riverside and CEQA guidelines; historic research; co-authoring of cultural resources project report. January-March 2002.

Cultural Resources Survey and Test of Sites Within the Proposed French Valley Specific Plan/EIR, Riverside County, California: Project manager/director of the investigation of two prehistoric and three historic sites—included project coordination and budgeting; survey of project area; Native American consultation; direction of field crews; assessment of sites for significance based on CEQA guidelines; cultural resources project report in prep. July-August 2000.

Cultural Resources Survey and Test of Sites Within the Proposed Development of the Menifee Ranch, Riverside County, California: Project manager/director of the investigation of one prehistoric and five historic sites—included project coordination and budgeting; direction of field crews; feature recordation; historic structure assessments; assessment of sites for significance based on CEQA guidelines; historic research; co-authoring of cultural resources project report. February-June 2000.

Salvage Mitigation of a Portion of the San Diego Presidio Identified During Water Pipe Construction for the City of San Diego, California: Project archaeologist/director—included direction of field crews; development and completion of data recovery program; management of artifact collections cataloging and curation; data synthesis and authoring of cultural resources project report in prep. April 2000.

Enhanced Cultural Resource Survey and Evaluation for the Tyrian 3 Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. April 2000.

Enhanced Cultural Resource Survey and Evaluation for the Lamont 5 Project, Pacific Beach, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. April 2000.

Enhanced Cultural Resource Survey and Evaluation for the Reiss Residence Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. March-April 2000.

Salvage Mitigation of a Portion of Site SDM-W-95 (CA-SDI-211) for the Poinsettia Shores Santalina Development Project and Caltrans, Carlsbad, California: Project archaeologist/ director—included direction of field crews; development and completion of data recovery program; management of artifact collections cataloging and curation; data synthesis and authoring of cultural resources project report in prep. December 1999-January 2000.

Survey and Testing of Two Prehistoric Cultural Resources for the Airway Truck Parking Project, Otay Mesa, California: Project archaeologist/director—included direction of field crews; development and completion of testing recovery program; assessment of site for significance based on CEQA guidelines; authoring of cultural resources project report, in prep. December 1999-January 2000.

Cultural Resources Phase I and II Investigations for the Tin Can Hill Segment of the Immigration and Naturalization Services Triple Fence Project Along the International Border, San Diego County, California: Project manager/director for a survey and testing of a prehistoric quarry site along the border—NRHP eligibility assessment; project coordination and budgeting; direction of field crews; feature recordation; meeting and coordinating with U.S. Army Corps of Engineers; co-authoring of cultural resources project report. December 1999-January 2000.

Mitigation of a Prehistoric Cultural Resource for the Westview High School Project for the City of San Diego, California: Project archaeologist/ director—included direction of field crews; development and completion of data recovery program including collection of material for specialized faunal and botanical analyses; assessment of sites for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; co-authoring of cultural resources project report, in prep. October 1999-January 2000.

Mitigation of a Prehistoric Cultural Resource for the Otay Ranch SPA-One West Project for the City of Chula Vista, California: Project archaeologist/director—included direction of field crews; development of data recovery program; management of artifact collections cataloging and curation; assessment of site for significance based on CEQA guidelines; data synthesis; authoring of cultural resources project report, in prep. September 1999-January 2000.

Monitoring of Grading for the Herschel Place Project, La Jolla, California: Project archaeologist/ monitor—included monitoring of grading activities associated with the development of a single- dwelling parcel. September 1999.

Survey and Testing of a Historic Resource for the Osterkamp Development Project, Valley Center, California: Project archaeologist/ director—included direction of field crews; development and completion of data recovery program; budget development; assessment of site for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; authoring of cultural resources project report. July-August 1999.

Survey and Testing of a Prehistoric Cultural Resource for the Proposed College Boulevard Alignment Project, Carlsbad, California: Project manager/director —included direction of field crews; development and completion of testing recovery program; assessment of site for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; authoring of cultural resources project report, in prep. July-August 1999.

Survey and Evaluation of Cultural Resources for the Palomar Christian Conference Center Project, Palomar Mountain, California: Project archaeologist—included direction of field crews; assessment of sites for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; authoring of cultural resources project report. July-August 1999.

Survey and Evaluation of Cultural Resources at the Village 2 High School Site, Otay Ranch, City of Chula Vista, California: Project manager/director —management of artifact collections cataloging and curation; assessment of site for significance based on CEQA guidelines; data synthesis; authoring of cultural resources project report. July 1999.

Cultural Resources Phase I, II, and III Investigations for the Immigration and Naturalization Services Triple Fence Project Along the International Border, San Diego County, California: Project manager/director for the survey, testing, and mitigation of sites along border—supervision of multiple field crews, NRHP eligibility assessments, Native American consultation, contribution to Environmental Assessment document, lithic and marine shell analysis, authoring of cultural resources project report. August 1997- January 2000.

Phase I, II, and II Investigations for the Scripps Poway Parkway East Project, Poway California: Project archaeologist/project director—included recordation and assessment of multicomponent prehistoric and historic sites; direction of Phase II and III investigations; direction of laboratory analyses including prehistoric and historic collections; curation of collections; data synthesis; coauthorship of final cultural resources report. February 1994; March-September 1994; September-December 1995.

Andrew J. Garrison, MA, RPA

Project Archaeologist

Brian F. Smith and Associates, Inc.
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Education

Master of Arts, Public History, University of California, Riverside	**2009**
Bachelor of Science, Anthropology, University of California, Riverside	**2005**
Bachelor of Arts, History, University of California, Riverside	**2005**

Professional Memberships

Register of Professional Archaeologists
Society for California Archaeology
Society for American Archaeology
California Council for the Promotion of History
Society of Primitive Technology
Lithic Studies Society
California Preservation Foundation
Pacific Coast Archaeological Society

Experience

Project Archaeologist — **June 2017–Present**
Brian F. Smith and Associates, Inc. — **Poway, California**

Project management of all phases of archaeological investigations for local, state, and federal agencies including National Register of Historic Places (NRHP) and California Environmental Quality Act (CEQA) level projects interacting with clients, sub-consultants, and lead agencies. Supervise and perform fieldwork including archaeological survey, monitoring, site testing, comprehensive site records checks, and historic building assessments. Perform and oversee technological analysis of prehistoric lithic assemblages. Author or co-author cultural resource management reports submitted to private clients and lead agencies.

Senior Archaeologist and GIS Specialist — **2009–2017**
Scientific Resource Surveys, Inc. — **Orange, California**

Served as Project Archaeologist or Principal Investigator on multiple projects, including archaeological monitoring, cultural resource surveys, test excavations, and historic building assessments. Directed projects from start to finish, including budget and personnel hours proposals, field and laboratory direction, report writing, technical editing, Native American consultation, and final report submittal. Oversaw all GIS projects including data collection, spatial analysis, and map creation.

Preservation Researcher — **2009**
City of Riverside Modernism Survey — **Riverside, California**

Completed DPR Primary, District, and Building, Structure and Object Forms for five sites for a grant-funded project to survey designated modern architectural resources within the City of Riverside.

Information Officer **2005, 2008–2009**
Eastern Information Center (EIC), University of California, Riverside **Riverside, California**

Processed and catalogued restricted and unrestricted archaeological and historical site record forms. Conducted research projects and records searches for government agencies and private cultural resource firms.

Reports/Papers

2019 A Class III Archaeological Study for the Tuscany Valley (TM 33725) Project National Historic Preservation Act Section 106 Compliance, Lake Elsinore, Riverside County, California. Contributing author. Brian F. Smith and Associates, Inc.

2019 A Phase I and II Cultural Resources Assessment for the Jack Rabbit Trail Logistics Center Project, City of Beaumont, Riverside County, California. Brian F. Smith and Associates, Inc.

2019 A Phase I Cultural Resources Assessment for the 10575 Foothill Boulevard Project, Rancho Cucamonga, California. Brian F. Smith and Associates, Inc.

2019 Cultural Resources Study for the County Road and East End Avenue Project, City of Chino, San Bernardino County, California. Brian F. Smith and Associates, Inc.

2019 Phase II Cultural Resource Study for the McElwain Project, City of Murrieta, California. Contributing author. Brian F. Smith and Associates, Inc.

2019 A Section 106 (NHPA) Historic Resources Study for the McElwain Project, City of Murrieta, Riverside County, California. Brian F. Smith and Associates, Inc.

2018 Cultural Resource Monitoring Report for the Sewer Group 818 Project, City of San Diego. Brian F. Smith and Associates, Inc.

2018 Phase I Cultural Resource Survey for the Stone Residence Project, 1525 Buckingham Drive, La Jolla, California 92037. Brian F. Smith and Associates, Inc.

2018 A Phase I Cultural Resources Assessment for the Seaton Commerce Center Project, Riverside County, California. Brian F. Smith and Associates, Inc.

2017 A Phase I Cultural Resources Assessment for the Marbella Villa Project, City of Desert Hot Springs, Riverside County, California. Brian F. Smith and Associates, Inc.

2017 Phase I Cultural Resources Survey for TTM 37109, City of Jurupa Valley, County of Riverside. Brian F. Smith and Associates, Inc.

2017 A Phase I Cultural Resources Assessment for the Winchester Dollar General Store Project, Riverside County, California. Brian F. Smith and Associates, Inc.

2016 John Wayne Airport Jet Fuel Pipeline and Tank Farm Archaeological Monitoring Plan. Scientific Resource Surveys, Inc. On file at the County of Orange, California.

2016 Historic Resource Assessment for 220 South Batavia Street, Orange, CA 92868 Assessor's Parcel Number 041-064-4. Scientific Resource Surveys, Inc. Submitted to the City of Orange as part of

Mills Act application.

2015 Historic Resource Report: 807-813 Harvard Boulevard, Los Angeles. Scientific Resource Surveys, Inc. On file at the South Central Coastal Information Center, California State University, Fullerton.

2015 Exploring a Traditional Rock Cairn: Test Excavation at CA-SDI-13/RBLI-26: The Rincon Indian Reservation, San Diego County, California. Scientific Resource Surveys, Inc.

2014 Archaeological Monitoring Results: The New Los Angeles Federal Courthouse. Scientific Resource Surveys, Inc. On file at the South Central Coastal Information Center, California State University, Fullerton.

2012 Bolsa Chica Archaeological Project Volume 7, Technological Analysis of Stone Tools, Lithic Technology at Bolsa Chica: Reduction Maintenance and Experimentation. Scientific Resource Surveys, Inc.

Presentations

2017 “Repair and Replace: Lithic Production Behavior as Indicated by the Debitage Assemblage from CA-MRP-283 the Hackney Site.” Presented at the Society for California Archaeology Annual Meeting, Fish Camp, California.

2016 “Bones, Stones, and Shell at Bolsa Chica: A Ceremonial Relationship?” Presented at the Society for California Archaeology Annual Meeting, Ontario, California.

2016 “Markers of Time: Exploring Transitions in the Bolsa Chica Assemblage.” Presented at the Society for California Archaeology Annual Meeting, Ontario, California.

2016 “Dating Duress: Understanding Prehistoric Climate Change at Bolsa Chica.” Presented at the Society for California Archaeology Annual Meeting, Ontario, California.

2014 “New Discoveries from an Old Collection: Comparing Recently Identified OGR Beads to Those Previously Analyzed from the Encino Village Site.” Presented at the Society for California Archaeology Annual Meeting, Visalia, California.

2012 Bolsa Chica Archaeology: Part Seven: Culture and Chronology. Lithic demonstration of experimental manufacturing techniques at the April meeting of The Pacific Coast Archaeological Society, Irvine, California.

APPENDIX B

Archaeological Records Search

(Deleted for Public Review; Bound Separately)

APPENDIX C

NAHC Sacred Lands File Search Results

(Deleted for Public Review; Bound Separately)

Appendix C-1
Archaeological Test Results

Brian F. Smith and Associates, Inc.
Archaeology / Biology / History / Paleontology / Air Quality / Traffic / Acoustics

October 18, 2021

Cheryl A. Tubbs
Lilburn Corporation
1905 Business Center Drive
San Bernardino, California 92408

Subject: Archaeological Test Results at 776 West Mill Street, City of San Bernardino

Dear Cheryl:

The following letter has been prepared for your review and submittal to the City of San Bernardino to report the results of the pre-grading archaeological testing program conducted for the 776 West Mill Street Project (Assessor's Parcel Numbers 0136-142-02 and 0136-151-06, -09, -11, and -19) located north of West Mill Street and east of Interstate 215 in the city of San Bernardino, San Bernardino County, California. The purpose of our investigation was to implement the pre-grading subsurface testing at the project as outlined in the Cultural Resources Pre-Grade Test Plan and subsequent revisions to that plan. To gather sufficient information to formulate an assessment of the potential for Native American sites within the property, seven short backhoe trenches were excavated at pre-determined locations across the property. The screening process was monitored by representatives of the San Manuel Band of Mission Indians. All testing was completed on October 14, 2021.

The methodology implemented to conduct the testing program involved the excavation of backhoe trenches at locations agreed to by the San Manuel Band, the City of San Bernardino, the project applicant, and the archaeologists. The excavation of trenches was monitored by field archaeologists from Brian F. Smith and Associates, Inc. (BFSA) and the Native American representatives. The screening of excavated soil was accomplished with a mechanical screen. The distribution of trenches at the property is illustrated in the attached Trench Location Map.

The backhoe trenches were excavated to at least 120 centimeters in depth and 200 centimeters in length (Plate 1). The quantity of soil excavated varied between each trench based on the depth of the excavation proposed for the grading of the property. Likewise, the quantity of soil sampled from each trench and screened to search for Native American artifacts varied depending upon the depth of the upper soil horizon that would correspond to the projected depth of the original ground surface prior to the placement of the fill soil on the property. Soil from the trenches was mechanically sifted through one-eighth-inch mesh screen to search for artifacts or evidence of Native American occupation. The trench coverage was sufficient to characterize the entire property.

Plate 1: North wall profile of Test Trench C at 1.4 meters in depth.

Our previous study of this property in 2021 resulted in the conclusion that no cultural resources were present within the project or the vicinity. The excavation of the seven backhoe trenches resulted in the conclusion that no Native American archaeological deposits, artifacts, or features are located within this property. All of the seven trenches produced modern and historic glass fragments within the recovery. No prehistoric resources were identified.

Based upon the information from the field investigation, there does not appear to be any evidence of prehistoric Native American use of this property. The soil observed during the trenching was typically light brown, loose to moderately compacted sandy material with evidence of alluvial cobbles. In conclusion, the trenches excavated within the project did not include the observation of any cultural deposits. The information from the testing should be adequate to inform the consulting tribes that monitoring of grading is optional given the extremely small potential to encounter any prehistoric materials. I recommend that the project be allowed to continue to the grading phase.

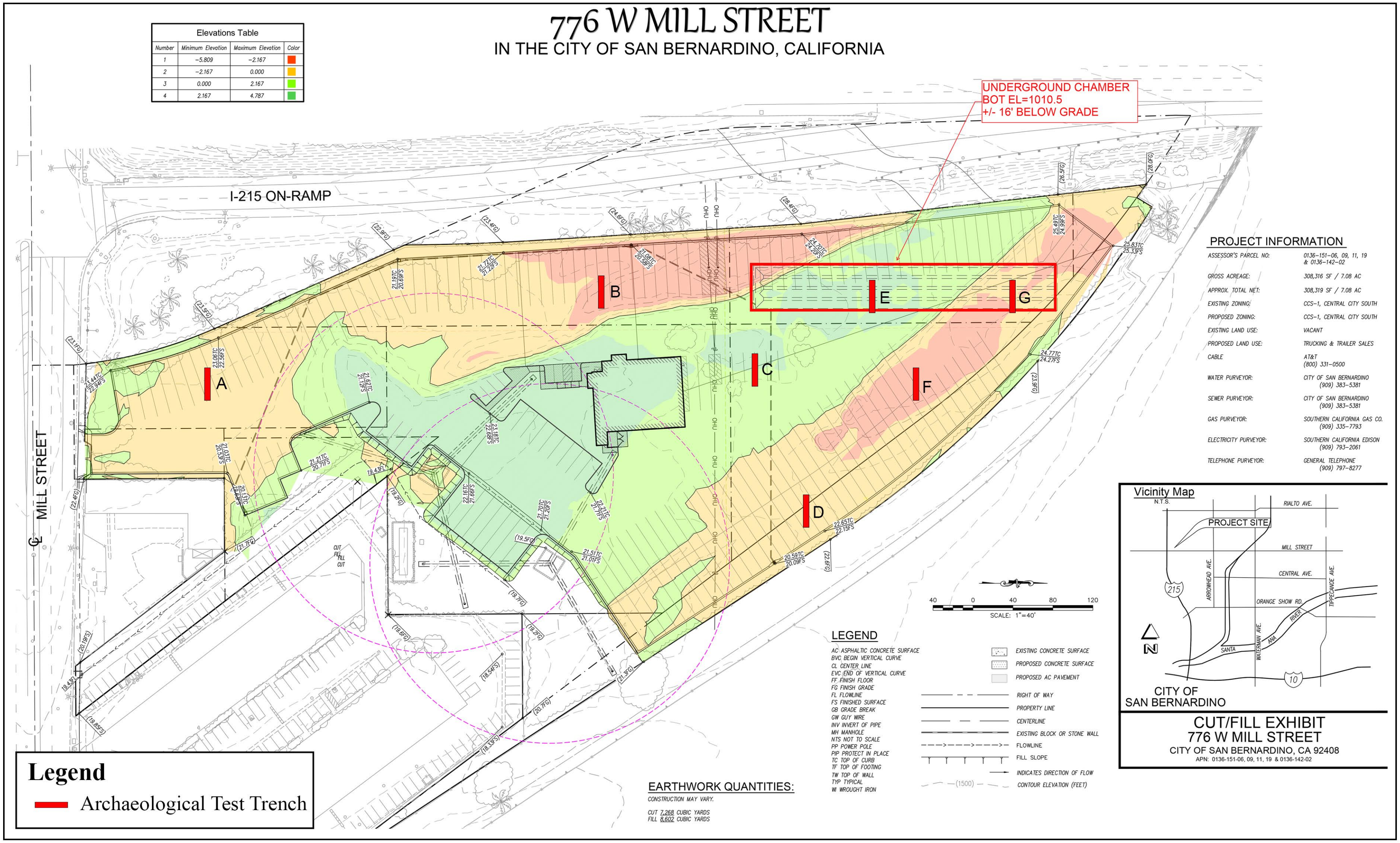
If you have any questions regarding our assessment, please contact me.

Sincerely,

Brian F. Smith

Brian F. Smith
BFS:dkg

Attachment 1: Trench Location Map



Elevations Table

Number	Minimum Elevation	Maximum Elevation	Color
1	−5.809	−2.167	🟥
2	−2.167	0.000	🟧
3	0.000	2.167	🟩
4	2.167	4.787	🟩

PROJECT INFORMATION

ASSESSOR'S PARCEL NO:	0136–151–06, 09, 11, 19 & 0136–142–02
GROSS ACREAGE:	308,316 SF / 7.08 AC
APPROX. TOTAL NET:	308,319 SF / 7.08 AC
EXISTING ZONING:	CCS–1, CENTRAL CITY SOUTH
PROPOSED ZONING:	CCS–1, CENTRAL CITY SOUTH
EXISTING LAND USE:	VACANT
PROPOSED LAND USE:	TRUCKING & TRAILER SALES
CABLE	AT&T (800) 331–0500
WATER PURVEYOR:	CITY OF SAN BERNARDINO (909) 383–5381
SEWER PURVEYOR:	CITY OF SAN BERNARDINO (909) 383–5381
GAS PURVEYOR:	SOUTHERN CALIFORNIA GAS CO. (909) 335–7793
ELECTRICITY PURVEYOR:	SOUTHERN CALIFORNIA EDISON (909) 793–2061
TELEPHONE PURVEYOR:	GENERAL TELEPHONE (909) 797–8277

Figure 1

Trench Location Map

The 776 West Mill Street Project

Appendix D
Geotechnical Investigation

SOILS SOUTHWEST, INC.
SOILS, MATERIALS AND ENVIRONMENTAL ENGINEERING CONSULTANTS

897 VIA LATA, SUITE N • COLTON, CA 92324 • (909) 370-0474 • (909) 370-0481 • FAX (909) 370-3156

Report of Geotechnical Investigations & Soil Infiltration Testing for WQMP-BMP Design

Proposed TEC Equipment
Planned Trailer Facility with Guard Shack and Wash Bays
776 W. Mill Street
City of San Bernardino, California

Project No. 21001-F/BMP

April 6, 2021

Prepared for:

TEC Equipment, Inc.
Attention: Mr. David Thompson
776 West Mill Street
San Bernardino, California

soilssouthwest@aol.com
Established 1984

SOILS SOUTHWEST, INC.
SOILS, MATERIALS AND ENVIRONMENTAL ENGINEERING CONSULTANTS

897 VIA LATA, SUITE N • COLTON, CA 92324 • (909) 370-0474 • (909) 370-0481 • FAX (909) 370-3156

April 6, 2021

Project No. 21001 F/BMP

TEC Equipment, Inc.
776 West Mill Street
San Bernardino, California

Attention: Mr. David Thompson, Director

Subject: Reports of Geotechnical Investigations &
Soil Infiltration Testing for WQMP-BMP Design
Proposed TEC Equipment Yard/Trailer Parking and Guard Shack
776 W. Mill Street, City of San Bernardino, California

Reference: Site Plan Prepared by Bonadiman Associates

Gentlemen:

Presented herewith are the Reports of Geotechnical Investigations and Soil Infiltration Testing for WQMP-BMP Design for the proposed equipment yard, trailer parking and guard shack to be located at 776 West Mill Street, City of San Bernardino, California. In absence of topographic and development plans the recommendations included should be considered as "preliminary", subject to revision following detailed development plans review.

Based on test explorations completed it is our opinion that the site soils, in general, consists of upper loose and compressible fine to medium coarse sands with rock fragments and scattered rocks, overlying variegating deposits of moderately dense silty, gravely medium to coarse-to-coarse sands to the maximum 51.5 feet depth explored. No shallow-depth groundwater or bedrock was encountered.

Based on review of the available published public documents, it is understood that the site is not situated within an A-P Special Studies Zone. However, as per the California Department of Water Resources (attached), March 9, 1951, it is understood that the shallowest groundwater is at about 0.2 feet below grade. The results of seismically induced soil liquefaction analyses (attached) indicate the site soils are susceptible to soils liquefaction in event of a strong motion earthquake, with pre-construction and post-construction seismically induced ground settlements estimated to about 0.708-0.934-inch and 0.239-inch, respectively.

It is our opinion that the planned development should be considered feasible provided the recommendations described herein are implemented in design and construction.

Respectfully submitted,
Soils Southwest, Inc.

Moloy Gupta, RCE 31708

MOLOY K. GUPTA
No 31708
Exp. 12-31-22
CIVIL

JF
John Flippin
Project Coordinator

Dist/ 1-addressee, dothompson@tecequipment.com cc: ed@bonadiman.com

soilssouthwest@aol.com
Established 1984

1.0 Introduction

Presented herewith are the Reports of Geotechnical Investigations and Soil Infiltration Testing for WQMP-BMP Design conducted for the site of the planned equipment yard paving, parking, and guard shack/office/maintenance facility to be located at 776 West Mill Street, City of San Bernardino, California.

The recommendations included should be considered valid when the following conditions are fulfilled:

i. Pre-grade meeting with contractor, public agency, project civil and soils engineers,
ii. Continuous grading observations and excavated bottom verifications by soils engineer prior to engineered backfill placement,
iii. Continuous observations and testing during site preparation and structural fill soils placement,
iv. Observation and inspection of footing trenching prior to steel and concrete placement,
v. Plumbing trench backfill placement prior to concrete slab-on-grade placement,
vi. On and off-site utility trench backfill testing and verifications, and
vii Consultations as required during construction, or upon your request.

1.1 Proposed Development

Based on the preliminary project information supplied, it is understood that the subject development will primarily include asphalt or concrete paving, parking, and driveways, along with a minor guard office/truck maintenance facility and wash bays. Pre-engineered metal, concrete block, or concrete framing structure with spread footings and with concrete slab-on-grades, are assumed. Moderate site preparations and grading should be anticipated.

1.2 Site Description

The existing irregular shaped property is currently vacant and unimproved. In general, the site is bounded by a flood control channel and vacant undeveloped property on the north and northeast, by West Mill Street on the south, commercial property on the east, and by northbound Interstate 215 onramp on the west. The overall vertical relief within the property is currently unknown with incidental surface runoff appearing to flow towards the south and west. Except for the existing radio towers, trailer, scattered soil piles and debris, surface seasonal weeds, and scattered mature trees and shrubbery, presence of no other significant features are noted.

2.0 Scope of Services

Geotechnical evaluations included review of the available USGS publications for the site and its adjacent, along with sub-surface geotechnical explorations, soil sampling, necessary laboratory testing, engineering analyses and the preparation of this report. In general, our Scope of Services include the following:

Field Explorations

For geotechnical evaluations, six (6) exploratory test borings (B-1 to B-6) were made using a hollow-stem auger drilling rig advanced to maximum depth of 51 feet below the existing grade surface. Supplemental two (2) test explorations (P-1and P-2) advanced to maximum 12 feet below grade are included for determination of water infiltration rate for WQMP-BMP design.

Prior to test excavations, an underground utility clearance was established with Underground Service Alert (USA) of Southern California to avoid possible subsurface life-line obstruction and rupture. Following necessary soil sampling and in-situ testing, the exploratory test holes were backfilled using excavated spoils with minimum compaction effort. Collected samples were subsequently transferred to our laboratory for necessary geotechnical testing. Approximate test excavation locations are shown on the attached Plate 1.

Laboratory Testing

Representative bulk and undisturbed site soils were tested in laboratory to aid in the soils classification and to evaluate relevant engineering properties pertaining to the project requirements. In general, the laboratory tests completed include the following:

- In-situ moisture contents and dry density (ASTM Standard D2216),
- Maximum Dry Density and Optimum Moisture Content (ASTM Standard D1557),
- Direct Shear (ASTM Standard D3080), and
- Consolidation Test (ASTM Standard D2435)

Description of the test results and test procedures used are provided in Appendix B.

Chemical testing soil corrosivity potential evaluations, including pH, Sulfate, Chloride and Resistivity. Results of such are included in later section of this report.

Based on the field investigations and evaluations completed as described, necessary geotechnical recommendations are included for design of foundations, slab-on-grade, site preparations and grading and monitoring during construction.

3.0 Groundwater

No shallow depth groundwater was encountered. However, based on review of the available documents the following table lists the historical groundwater table as based on the information as supplied by the local reporting agency.

GROUNDWATER TABLE	
Reporting Agency	California Department of Water Resources website, Montagna 2008 maps
Well Number	01S04W-09J001S
Well Monitoring Agency	California Department of Water Resources
Well Location: Township/Range/Section	T01S-R04W-Section 9
Current Depth to Water (Measured in feet)	176.26
Current Date Water was Measured	October 21, 2008
USGS Shallowest Depth to Groundwater (measured in feet)	0.2
Date the water table measured	March 9,1951

4.0 Faulting and Seismicity

4.1 Faulting and Seismicity

Based on the information published by the Department of Conservation, State of California, it is understood that the site is not situated within an A-P Special Study Zone, where a fault(s) runs through the site or its adjacent. However, considering the Southern California being in a seismically risky area, it is our opinion that the implementation of the design and construction knowhow as described in the current CBC design procedures should be considered to benefit the development planned as described.

4.2 Direct or Primary Seismic Hazards

Surface ground rupture along with active fault zones and ground shaking represent primary or direct seismic hazards to structures. There are no known active or potentially active faults that pass through or towards the subject site, and the site is not situated within an AP Special Studies Zone. According to the current CBC, the site is considered within Seismic Zone 4. As a result, it is likely that moderate to severe ground shaking may be experienced for the development proposed.

4.3 Induced or Secondary Seismic Hazards

In addition to ground shaking, effects of seismic activity may include flooding, land-sliding, lateral spreading, ground settlements, and subsidence. Potential effects of such are discussed as below.

4.3.1 Flooding

Flooding hazards include tsunamis (seismic sea waves), Seiches, and failure of manmade reservoirs, tank, and aqueducts. Considering the observed presence of a man-made berm running from northeast to southwest creating a confined low area adjacent to the existing on-ramp embankment along with the open flood control channel to the north and northeast, there is low potential for flooding. However, when graded as recommended herein it is our opinion that the potential for flooding should be considered "remote".

4.3.2 Land Sliding

Considering the subject site being near level with developed surrounding, potential for seismically induced land sliding is considered "remote".

4.3.3 Lateral Spreading

Structures or facilities proposed are expected to withstand predicted ground softening and/or predicted vertical and lateral ground spreading/displacements, to *an acceptable level of risk*. Seismically induced lateral spreading involves lateral movement of soils due to ground shaking.

The topography of the site being near level, it is our opinion that the potential for seismically induced lateral ground spreading should be considered "remote".

4.4 Site Soils Liquefaction Susceptibility

Liquefaction is caused by build-up of excess hydrostatic pressures in saturated cohesionless soils due to cyclic stress generated by ground shaking. The significant factors on which liquefaction potential of a soil deposit depends, among others, soil type, relative soil density, intensity of earthquake, duration of ground shaking, and depth of ground water, among others.

Soil liquefaction evaluations conducted based on SPT blow counts and the reported shallowest groundwater depth at 0.2 foot as described earlier, it is our opinion that the site is susceptible to soils liquefaction in the event of a strong motion earthquake.

Reported proximity of earthquake fault, the historical groundwater table as described, along with the presence of loose to medium dense silty sandy subgrades with low SPT blow counts as described in test boring logs, structural design should consider the seismically induced pre-construction and post-construction minor settlement potentials as described as below.

Considering a Factor of Safety, FS=1.1, earthquake induced total and differential settlements for the site soils currently existing (pre-construction) are estimated to about 0.708 and 0.934-inch, respectively as described in the following table and in Appendix D of this report.

Liquefaction Induced Soils Settlement Potentials (Pre-Construction up to 10ft)

DYNAMIC SETTLEMENT	MEASURED IN INCHES
Settlement of Saturated Soils	1.42
Settlement of Dry Soils	0.00
Total Settlement of Saturated and Dry Soils	1.42
DIFFERENTIAL SETTLEMENT	0.708 and 0.934-inch

Post-Construction anticipated total and differential ground-settlements are 0.239-inch and 0.316-inch, respectively as evaluated and shown in Appendix D of this report.

In design, vertical accelerations may be assumed to about 1/3 to 2/3 of the estimated horizontal ground acceleration (PGA) as described in the following sections.

4.5 Seismic Design Coefficients

Using s Site Coordinates of 34.092306°N, -117.300346W and considering the site being situated at about 0.70 miles from the San Jacinto Fault. For foundation and structural design, the following seismic parameters are suggested based on the current 2019 CBC.

Recommended values are based upon the USGS ASCE 7-16 Hazard Reports Parameters and the California Geologic Survey: PSHA Ground Motion Interpolator Supplemental seismic parameters are provided in Appendix C of this report. The following presents the seismic design parameters as based on the available publications as currently published by the California Geological Survey and 2019 CBC

TABLE 4.5.1 Seismic Design Parameters

CBC Chapter 16	2019 ASCE 7-16 Standard Seismic Design Parameters	Recommended Values
1613A.5.2	Site Class	D
1613.5.1	The mapped spectral accelerations at short period	S_s
1613.5.1	The mapped spectral accelerations at 1.0-second period	S_1
1613A5.3(1)	Site Class D / Seismic Coefficient, S_s	2.391 g
1613A5.3(2)	Site Class D / Seismic Coefficient, S_1	0.958 g
1613A5.3(1)	Site Class D / Seismic Coefficient, F_a	1.000 g
1613A5.3(2)	Site Class D / Seismic Coefficient, F_v	Not available
16A-37 Equation	Spectral Response Accelerations, $S_{Ms} = F_a S_s$	2.391 g
16A-38 Equation	Spectral Response Accelerations, $S_{M1} = F_v S_1$	Not available
16A-39 Equation	Design Spectral Response Accelerations, $S_{Ds} = 2/3 \times S_{Ms}$	1.594g
16A-40 Equation	Design Spectral Response Accelerations, $S_{D1} = 2/3 \times S_{Ms}$	Not available

TABLE 4.5.2 Seismic Source Type

Based on California Geological Survey-Probabilistic Seismic Hazard Assessment Peak Horizontal Ground Acceleration (PHGA) having a 10 percent probability of exceedance in a 50- year period is described below:

Seismic Source Type / Appendix C	
Nearest Maximum Fault Magnitude	M>\=7.35
Peak Horizontal Ground Acceleration	0.663g

In design, vertical acceleration may be assumed to about 1/3 to 2/3 of the estimated horizontal ground accelerations described.

It should be noted that lateral force requirement in design by structural engineer should be intended to resist total structural collapse during an earthquake. During lifetime use of the structure built, it is our opinion that some structural damage may be anticipated requiring some structural repairs. It is recommended that the described seismic design parameters should be incorporated in structural design and construction as deemed necessary by the project structural engineers.

5.0 Evaluations and Recommendations

5.1 General Evaluations

With the presence of the upper compressible dry and loose alluviums existing as described, it is our opinion that no new structural fills or load bearing footings should be established bearing directly on the surface soils currently existing.

For adequate paving/parking and for structural support for the planned truck/trailer facility, and to minimize potentials for seismically induced excessive soils settlements as described, it is our opinion that the near grade loose and compressible alluviums should be subexcavated, followed by their replacement as engineered fills compacted to 95% or better.

Based on field explorations, laboratory testing and subsequent engineering analysis, the following conclusions and recommendations are presented for the site under study:

(i) Moderate site clearance should be expected, including, but not be limited to, scattered debris, stockpiles, and others.

(ii) From geotechnical viewpoint, the site should be considered suitable for the development proposed, provided the recommendations presented are incorporated in the final design and construction. Site preparations and grading should be performed in accordance with the current CBC and as per the general applicable grading recommendations as provided in Section 6 of this report. Continuous grading observations and testing by soils engineer are recommended.

(iii) It is our opinion that preparations for structural pad should be in form of subexcavations, scarification and moisturization, followed by their replacement as engineered fills compacted to the minimum 95%. In event new structural fill soils placements is required over the grades currently existing, such should be placed following subgrade preparations as described in later section of this report. Supplemental recommendations are included for site preparations and grading for the planned highly loaded truck and conventional auto traffic and parking.

(iv) It is recommended that structural footings for the maintenance structure be established exclusively into engineered fills of local sandy soils or its equivalent, compacted to minimum 95% of the soil's Maximum Dry Density at near Optimum Moisture conditions. Construction of footings and slabs straddling over cut/fill transition, should be avoided.

(v) Structural design considerations should include probability for "moderate to high" peak ground acceleration from nearby active earthquake fault as described in this report. The effects of ground shaking, however, can be minimized by implementing the seismic design requirements and the procedures as outlined in the current CBC and as described in this report.

(vi) Provisions should be maintained during construction to divert incidental rainfall away from the structural pad constructed.

(vii) It is our opinion that, if site preparations and grading are performed as per the generally accepted construction practices as described, the proposed development will not adversely affect the stability of the site, or its adjacent.

5.2 Site Preparations for Paving/Parking, Maintenance Bay and Office Building Structural Pad

The subgrades to received paving should subexcavated/scarified to minimum 18-inch, followed by their replacement compacted to minimum 95% and the base material compacted to 95% of the soils/base material Maximum Dy Density as determined by ASTM Standard D1557. Use of thickened edge should be considered to protect paving from accidental edge-loading and/or lateral sliding.

Considering site soils susceptibility to seismically For Maintenance Bays, Office and Guard Shack Structural Pad site preparations should include minimum 5 feet subexcavatons, followed by the local soils' replacement in 6- to 8-inch-thick lifts compacted to minimum 95%.

The paving materials used, including the asphalt and aggregate base should meet the minimum gradation and quality requirements of the Green Book and the requirements of the Caltrans Standard Specifications. It should be noted that with repeated use of the paving by heavy trucks etc., regular maintenance should be expected.

In absence of precise grading plan, the proposed structural pads are expected to be established at or near the existing grade surface. The following general procedures are recommended for the paving/parking, office, truck trailer traffic and maintenance bays:

5.2.1 Flexible Asphalt Concrete Surface

Based on the Soils Sand Equivalent, SE, of 76, estimated soil R-value of 65 and Traffic Index, TI, of 6.5, for 20-year design life, the following recommendations are suggested for paving for truck storage/truck traffic yard planned:

Design Paving Section

Paving/Parking and Truck Storage	Traffic Index, TI, used	Designed asphalt (AC) Thickness	Designed Class II or CMB Thickness	Designed Total Thickness
On-Site Paving	6.5-7.0	4"	4"	8"

5.2.2 Alternative Rigid Concrete Paving

If selected, Rigid Concrete Paving may be considered as described as follows:

Materials	Autos/Light Trucks (TI=6.5)	Truck Traffic TI= 7.5
Portland Cement Concrete, PCC, over	5" (net)*	6" (net) *
Class II Base, or Miscellaneous Base compacted to min. 95%, over	-0-	-0-
local soils compacted to min. 95%	18"	18"

Note: *- use of paving reinforcing may be omitted provided the subgrades *prepared are compacted to minimum 95% and expansion joint spacings are limited to within 24 to 30-times the pcc thickness, or to within 12 to 15 feet* both-ways, with joint depth to minimum 1/3 of paving thickness.

Use of thickened edge should be considered to protect concrete paving from accidental edge-loading and/or lateral sliding. Regular maintenance should be expected.

Actual concrete paving thickness, construction/expansion joints and reinforcing requirements should be supplied by the project structural engineer using an Annual Daily Traffic (ADT), and a Soil Subgrade Reaction, ks, of 350 kcf.

5.2.3 Site Preparations for Maintenance Bays, Guard Shack and Office Structural Pad

Considering the upper existing compressible soils as encountered and site susceptibility for seismically induced soils liquefaction, it is our opinion that for structural support, site preparations should include minimum 5 feet subexcavations below the existing grade and minimum 5 feet beyond proposed footprint, followed by the excavated soils replacement in 6-8-inch-thick lifts, compacted to minimum 95%. For uniform structural support, an overall compacted fill mat thickness underneath footing should be at least 24-inch.

5.2.4 Structural Pad established Requiring Cut and Fill Transition (if any)

For the structural pads requiring cut and fill transition, if any, it is our opinion that to minimize potential for excessive differential settlements, following subexacavtions and fill soils placement, a minimum 24" thick compacted fill mat should be maintained underneath load bearing foundations compacted to minimum 95%.

Foot-print areas described shall be defined as the area of planned structural pad, plus the areas extending from the outer edge of the footing to either:

(i) A distance of 5 feet, or
(ii) To the nearest property line, or
(iii) To the nearest constraint, such as existing foundations, or
(iv) As described on the main text of this report.

.

The subexcavation depths described should be considered as "'preliminary'". Localized additional subexcavations may be required within areas underlain by undocumented fills, buried and abandoned utilities, among others. It is recommended that the excavated subgrades should be verified and approved by soils engineer prior to structural fill soil placement. Local soils free of debris, roots, organic or other non-structural materials, should be considered suitable for re-use as engineered backfill. Imported fill soils, if used, should be approved by soils engineer prior to their use and importation to the site.

General Earthwork recommendations are enclosed in Section 5 of with this report.

5.3 Structural Fills

5.3.1 Structural Fill Material

The local soils free of organic, roots, debris and rocks larger than 8-inch in diameter may be considered suitable for re-use as structural backfill. Backfills placed should be compacted to minimum 95% of the soil's Maximum Dry Density as determined by the ASTM D1557 test method.

Import soils, if required, should be similar to local soils or better as approved by soils engineer. In general, fill soils for structural support should non-expansive in nature meeting the following criteria:

Liquid Limit	<35
Plasticity Index	<15
Expansion Index	<20

5.3.2 Structural Fill Placement

Structural fills described should be placed in 6 to 8-inch thick loose lifts and uniformly moisture conditioned and compacted to minimum 95 percent. No fill shall be placed, spread, or compacted during unfavorable weather conditions.

5.4 Structural Foundations

For the soils when graded as described, use of an allowable vertical soil bearing capacity of 2000 psf may be considered.

For structural design, considering proximity of the nearby earthquake fault, along with the potential for site soil's liquefaction susceptibility during an earthquake, it is our opinion that in design, use of the Horizontal Peak Ground Acceleration (PGA) as described earlier should be considered. In addition, with the potentials for pre-and post- construction ground settlements as evaluated and as described, for structural support with "tolerable" settlements, the following foundation systems may be considered:

Alternative (i) Rigid Concrete Mat Foundations

Considering the site soils potential susceptibility to seismically induced soils liquefaction as described earlier, it is our opinion that Rigid Concrete Mat Foundations established on structural fills prepared as described earlier may be considered, with mat thickness and reinforcements requirements as based on superimposed dead-load, and the PGA as described. In addition, use of the following design parameters are suggested.

- Soil Modulus of Subgrade Reaction, ks, of 300 kcf, or as selected by the project design engineer,
- a soil vertical bearing capacity of 2000 psf., and
- soil Coefficient of Friction of 0.4.

Use of high-strength concrete will be at the discretion of the project design engineer.

Alternative (ii) Post-Tension Foundations

As an alternative, for structural support, it is our opinion that load-bearing post-tension construction may be considered as designed by post-tension professionals, using "very low" site soils expansion potential criteria. Supplemental design parameters will be supplied, if and, when requested.

It should be noted, however, that even with the ground improvements and structural mitigations described the adverse effects of ground shaking to the structure built cannot be fully ignored, thereby requiring minor to extensive repair/rebuilding. Use of flexible life-line connections are recommended.

Should the project structural engineer determine that more stringent design criteria are required, those criteria should supersede the design parameters supplied.

Alternative (iii) Spread Foundations

Alternatively, conventional load bearing spread footings sized to minimum 15- inch wide and 18-inch deep, or as determined by structural engineer may be based on soil vertical bearing capacity of 2000 psf. when installed on engineered grades prepared as described earlier. If normal code requirements are applied, the above capacities may further be increased by an additional 1/3 for short duration of loading which includes the effect of wind and seismic forces. From geotechnical viewpoint, footing reinforcements consisting of 2-#4 rebar placed near the top and 2-#4 near bottom of continuous footings are suggested. Additional reinforcements if specified by project structural engineer should be incorporated during construction.

Settlements of properly designed and constructed foundations supported exclusively into engineered fills of local soils or similar imported fills, carrying the maximum anticipated structural loadings of about 30 kips and 3 klf, for concentrated and spread footings, respectively, are expected to be within tolerable limits. Under static loading conditions, over a span of 40 ft, estimated total and differential settlements are estimated to about 1 and 1/2-inch, respectively.

Should the project structural engineer determine that more stringent design criteria are required, those criteria should supersede the design parameters supplied.

Excavated footing trenches prepared to receive concrete should be verified and approved by soils engineer in writing prior to forming and reinforcement placement.

5.5 Concrete Slab-on-Grade for Office Structure

The prepared subgrades to receive footings should be adequate for concrete slab-on-grade placement. For conventional loadings, structural slabs placed should be a minimum 4-inch thick, reinforced with #3 rebar at 18-inch o/c.

Within moisture sensitive areas (office etc.) concrete slabs should be underlain by 2-inch of clean sand, followed by commercially available 6-mil thick Stego Wrap or Visqueen or other similar commercially available vapor barrier, or as suggested by the project structural engineer. The sand used should be free of rock, with a minimum Sand Equivalent, SE of 30.

Subgrades to receive concrete should be moistened as would be expected in any such concrete placement. Use of low-slump concrete is recommended.

In addition, prior to surfacing, it is recommended that, utility trenches underlying concrete slabs and driveways, if any, should be thoroughly backfilled with gravelly sandy soils and mechanically compacted to the minimum percent compaction as described.

No jetting should be allowed for soil compaction in lieu of conventional mechanical compaction.

5.6 Active Pressure and Passive Resistance

For foundation design, with compacted level backfills using local gravelly sandy soils, equivalent active lateral fluid pressures of 35 pcf. and 45 pcf. may be considered for "unrestrained" and "restrained" structural conditions, respectively.

Resistance to lateral loads can be provided by friction acting at the base of foundation and by passive earth pressures. A coefficient of friction of 0.35 may be assumed with normal dead load forces for footings when established into compacted engineered fills.

For design, an allowable passive lateral earth resistance of 230 lb/ft2./ft depths may be assumed for sides of foundations poured against the grade as described above. Maximum passive earth resistance is recommended not to exceed 2300 lb/ft2.

The above values may be increased by 1/3 when designing for short duration wind or seismic forces. The above values are based on footings placed on compacted engineered fills. In the case where footing sides are formed, all backfill placed against the footings should be compacted to at least 90 percent of maximum dry density.

5.7 Resistance to Lateral Loads

For foundation design, resistance to lateral loads can be restrained by friction acting at the base of foundation and by passive earth pressure. A coefficient of friction of 0.35 may be assumed with normal dead load forces for footing established on compacted fill.

An allowable passive lateral earth resistance of 350 pounds per square foot per foot of depth may be assumed for the sides of foundations poured against compacted fills. The maximum lateral passive earth pressure is recommended not to exceed 3500 pounds per square foot.

For design, lateral pressures from local soils or its similar imported fills used as level backfills may be estimated from the following equivalent fluid density:

Active:	35 pcf
At Rest:	60 pcf

5.8 Shrinkage and Subsidence

It is our opinion that the local or similar imported fills when used in grading may be subjected to a volume change. Assuming a 95% relative compaction, and assuming an over-excavation and re-compaction depth of about 5 to 8 feet, such volume change for current grades due to shrinkage may be on the order of 8 to 10 percent fill placement. For estimation purpose, site subsoils subsidence may be approximated to about 2.5-inch when conventional construction equipment is used.

5.9 Utility Trench Backfill

Utility trenches backfill within the structural pads, gas station and beyond should be placed in accordance with the following recommendations:

- Trench backfill should be placed in thin lifts compacted to 90 percent or better of the laboratory maximum dry density for the soils used. As an alternative, clean granular sand may be used having a soil Sand Equivalent, SE, 30 or greater. Jetting is not recommended within utility trench backfill.
- Exterior trenches along a foundation or a toe of a slope and extending below a 1:1 imaginary line projected from the outside bottom edge of the footing or toe of the slope should be compacted to 90 percent of the Maximum Dry Density for the soils used during backfill. All trench excavations should conform to the requirements and safety as specified by the Cal-Osha

5.10 Pre-Construction Meeting

It is recommended that no grading operation should be commenced without the presence of a representative of this office. An on-site pre-grading meeting should be arranged in between soils engineer, grading contractor, project civil engineer, local governing agencies, and others prior to any construction.

5.11 Seasonal Limitations

No fill shall be placed, spread or rolled during unfavorable weather conditions. Where the work is interrupted by heavy rains, fill operations shall not be resumed until moisture conditions are considered favorable by the soils engineer.

5.12 Planters

To minimize potential differential settlement to foundations, planters requiring heavy irrigation should be restricted from using adjacent to footings. In event such becomes unavoidable, planter boxes with sealed bottoms, should be considered.

5.13 Landscape Maintenance

Only the amount of irrigation necessary to sustain plant life should be provided. Pad drainage should be directed towards streets and to other approved areas away from foundations. Slope areas should be planted with draught resistant vegetation. Over watering landscape areas could adversely affect the proposed site development during its life-time use.

5.14 Observations and Testing During Construction

Recommendations provided are based on the assumption that structural footings and slab-on-grade and driveway subgrades should be established exclusively into compacted fills. Excavated footings should be inspected, verified and certified by soils engineer prior to steel and concrete placement to ensure their sufficient embedment and proper bearing as recommended. Structural backfills discussed should be placed under direct observations and testing by this facility. Excess soils generated from footing excavations should be removed from pad areas and such should not be allowed on subgrades underlying concrete slab.

5.15 Plan Review

In absence of site-specific detailed development plan and detailed pad grade for our review, the recommendations included should be considered “preliminary”. It is recommended that grading and development plans should be reviewed when prepared in order verify adequacy of the geotechnical recommendations supplied. Supplemental recommendations may be warranted following grading plan review.

6.0 Earth Work/General Grading Recommendations

Site preparations and grading should involve over-excavation and replacement of local soils as structural fill compacted to 95% or better. Although no significant variations in soil conditions are anticipated, actual soils conditions may vary in the event subgrades exposed during construction are found different from those as described in this report. It will be the subcontractor's responsibility to notify Soils Southwest about sub soil variation, if any, for revised/updated recommendations.

Structural Backfill:

Local soils free of debris, large rocks and organic should be considered suitable for reuse as backfill. Loose soils, formwork and debris should be removed prior to backfilling retaining walls. On-site sand backfill should be placed and compacted in accordance with the recommended specifications provided below. Where space limitations do not allow conventional backfilling operations, special backfill materials and procedures may be required. Pea gravel or other select backfill can be used in limited space areas. Additional recommendations on such will be supplied when requested.

Site Drainage:

Adequate positive drainage should be maintained away from the structural pads constructed. A 2% desirable slope for surface drainage is recommended. Planters and landscaped areas adjacent to building should be designed as such so as to minimize water infiltration into sub-soils. Adjacent to footings, use of planter areas with closed bottoms and controlled drainage, should be considered.

Utility Trenches:

Buried utility conduits should be bedded and backfilled around the conduit in accordance with the project specifications. Where conduit underlies concrete slab-on-grade and pavement, the remaining trench backfill above the pipe should be mechanically compacted.

General Grading Recommendations:

Recommended general specifications for surface preparation to receive fill and compaction for structural and utility trench backfill and others are presented below.

1. Areas to be graded, backfilled or paved, shall be grubbed, stripped and cleaned of all buried and undetected debris, structures, concrete, vegetation and other deleterious materials prior to grading.

2. Where compacted fill is to provide vertical support for foundations, all loose, soft and other incompetent soils should be removed to full depth as approved by soils engineer, or at least up to the depth as previously described in this report. The areas of such removal should extend at least 5 feet beyond the perimeter of exterior foundation limit or to the extent as approved by soils engineer during grading.

3. The fills to support foundations and slab-on-grade should be compacted to minimum 95% of the soil's Maximum Dry Density at near Optimum. In order to minimize potential differential settlements to foundations and slabs straddling over cut and fill transition, cut portions following cut, should be further over excavated and such be replaced as engineered fill compacted to at least 95% of the soil's Maximum Dry Density as described in this report.

4. Utility trenches within building pad areas and beyond should be backfilled with granular material and such should be mechanically compacted to at least 90% of the maximum density for the material used.

5. Compaction for structural fills shall be determined relative to the maximum dry density as determined by ASTM D1557 compaction methods. All in-situ field density of compacted fill shall be determined by the ASTM D1556 standard methods or by other approved procedures.

6. All new imported soils if required shall be clean granular non-expansive material or as approved by the soils engineer.

7. During grading, fill soils shall be placed as thin layers, thickness of which following compaction shall not exceed six to eight inches.

8. No rocks over six to eight inches in diameter shall be permitted to use as a grading material without prior approval of soils engineer.

9. No jetting and/or water tampering be considered for backfill compaction for utility trenches without prior approval of the soils engineer. For such backfill, hand tampering with fill layers of 8 to 12 inches in thickness, or as approved by the soils engineer is recommended.

10. Utility trenches at depth and cesspool and abandoned septic tank existing within building pad areas and beyond (if encountered), should be excavated and removed, or such should be backfilled with gravel, slurry or by other material as approved by soils engineer.

11. Imported fill soils if required, should be equivalent to site soils or better. Such should be approved by the soils engineer prior to their use.

12. Grading required for pavement, side-walk or other facilities to be used by general public, should be constructed under direct observation of soils engineer or as required by the local public agencies.

13. A site meeting should be held between grading contractor and soils engineer prior to actual construction. Two days of prior notice will be required for such meeting.

7.0 WQMP-BMP Stormwater Disposal Design Water Infiltration Rate Using Porchet Method

Presented herewith are the preliminary results of soils infiltration testing performed for the planned storm water disposal design system proposed for the project site described. Considering the relatively homogenous gravely and silty sand during preliminary site explorations, no known changes are anticipated during site grading, however test results should be considered tentative given the potential for changes to site finish grade(s) or changes in soil conditions during grading.

Two (2) infiltration tests were performed at about 12 feet below the current grades at the far north end of the subject site.

Tests were performed using the standardized "falling-head" test converted to infiltration rate using the Porchet Method as per the guidelines in accordance with the Table 1, Infiltration Basin Option 2 of Appendix A of the Riverside County-Low Impact Development (LID) BMP design Handbook as well as the Appendices Section VII.3.8.2, Appendix VII: Infiltration Rate Evaluation Protocol and Factor of Safety Recommendations of the San Bernardino County Technical Guidance Document for Water Quality Management Plans Handbook. Approximate test locations are shown on Plate 1, attached.

The soils encountered consist in general of dry gravely medium to coarse sands with pebble and rock fragments to the maximum 12 feet depth explored and proposed chamber bottom (P-1 and P-2). For the purposes of determining the presence/or lack of presence of groundwater or any impermeable soils, soils encountered below twelve (12), deeper adjacent soil foundation borings consists of some silts and silty fine to medium coarse sands between 12 to 51 feet below existing surface grade, test boring (B-1 & B-2).

No free groundwater was encountered. Descriptions of the soils encountered are provided in the Log of Borings, P-1 and P-2 attached.

Based on the field infiltration testing completed, it is our opinion that for the infiltration system design proposed at about 12 feet below grade, the observed soils infiltration rates are 10.80 and 10.36 in/hr.

For design, it is suggested that use of an appropriate factor of safety as determined by the design engineer should considered to the observed rate to account for long-term saturation, inconsistencies in subsoil conditions, potential for silting and lack of maintenance. The observed soils percolation rates are provided in Table7.4.1 in Section 7.4 of this report.

7.1 EXCAVATED TEST BORINGS

For BMP soil infiltration testing at the location as shown on the accompanying Plate 1, two(2) tests borings (P-1 to P-2) were made using a hollow-stem auger drilling rig, advanced to approximately 12 feet below the current grade as suggested the project engineer. Water used during infiltration percolation testing was supplied by using water jugs.

7.2 METHODOLOGY AND TEST PROCEDURES:

EQUIPMENT SET-UP (POST EXCAVATION) PROCEDURES

Following test boring completion, each of the test holes were fitted with perforated pvc pipes backfilled with 2-inch thick crushed rock at the bottom to minimize potentials for scouring and caving. For testing, each test hole was initially filled using water supplied by water jugs.

Prior to actual testing, in order to determine test intervals, as per the Section 2.3 for deep percolation testing of the referenced handbook guideline, two consecutive readings were performed to determine if six (6) or more inches of water seeped in 25 minutes. Since 6 inches or more of water seeped away in less than 25 minutes for both P-1 and P-2, subsequent percolation testing was performed at 10-minute time intervals for at least the minimum six hours or until the rates were consistent.

Testing included water placement at about 10 feet below existing grade surface (inlet depth or approximately 24 inches above infiltration system bottom).

The final 10-minute recorded percolation test rates were converted into an Infiltration Rate (I_t) for inches per hour using the "Porchet Method" equation as described in the Reference 2, Riverside County Low Impact Development BMP Design Handbook.

7.3 INFILTRATION TEST RESULT

Based on the soils infiltration testing completed at the test locations and at the test depth as described, the observed soil percolation rates are 10.80"/hr and 10.36"/hr for the test locations P-1 and P-2 respectively.

Calculations to convert the percolation test rate to infiltration test rates in accordance with Section 2.3 of the County Handbook are presented in Table I and II below. For design, it is suggested that, use of a factor of safety of 2.0 to 3.0, or an appropriate Factor of Safety as selected by the design engineer should be considered to the observed field percolation rate described.

7.3.1. Summary Conversion Calculations

TABLE I

For WQMP-BMP design, based on the soils infiltration testing completed and, on the calculations as described, the following infiltration rates may be considered. Actual field test data are attached.

Observed Infiltration Rate for Design

Test Date Test No. (1-14-2021)	Relative Site Location	Test Depth (ft.) Below Grade	Observed Rate (inch/hour) Porchet Method
P-1	East	12.0	10.80
P-2	West	12.0	10.36

TABLE II
Conversion Table (Porchet Method)

Test No.	Depth Test Hole (inches)	Time Interval	Initial Depth (inch)	Final Depth (inch)	Initial Water Height (inch)	Final Water Height (inch)	Change Height/ Time	Average Head Height/Time
	D_T	Δ_T (Min)	D_O (in)	D_f (in)	$H_o=D_t-D_o$	$H_f=D_t-D_f$	$\Delta H= H_f-H_O$	$H_{avg} = (H_o+H_f)/2$
P-1	146	10	119	137.0	27.0	9.0	18	18
P-2	146	10	116.5	135.5	29.5	10.5	19	20

	Infiltration Rate (It)=ΔH60r/Δt(r+2Havg)		
	A	B	C
Test No.	ΔH60r	Δt(r+2Havg)	A/B=in/hr
P-1	4320	400	10.80
P-2	4560	440	10.36

Use of safety factor should be considered to account for long-term saturation, inconsistencies in subsoil conditions, along with the potential for silting of percolating soils.

The infiltration rate described is based on the in-situ testing completed at the locations as suggested by the project civil engineer. In event the final chamber location and depth vary considerably from those as described herein, supplemental soils infiltration testing may be warranted.

It should be noted that over prolong use and lack of maintenance the detention/infiltration basins or deep chambers constructed based on the suggested design rate may experience much lower infiltration rate due to the accumulation of silts, fines, oils, and others. Regular maintenance of the chambers in form of removal of debris, oil and fines are strongly recommended. A maintenance record of such is suggested for future use, if any.

Suggested Site Requirements for Stormwater BMP installation

The invert of stormwater infiltration shall be at least 10 feet above the groundwater elevation. Stormwater infiltration BMPs shall not be placed on steep slopes and shall not create the condition or potential for slopes instability.

Stormwater infiltration shall not increase the potential for static or seismic settlement of structures on or its adjacent.

Stormwater infiltration shall not place an increased surcharge on structures or foundations on or its adjacent. The pore-water pressure shall not be increased on soil retaining structures on or adjacent to the site.

The invert of stormwater infiltration shall be set back at least 15 feet, and outside a 1:1 plan drawn up from the bottom of adjacent foundations.

Stormwater infiltration shall not be located near utility lines where the introduction of stormwater could cause damage to utilities or settlement of trench backfill.

Stormwater infiltration is not allowed within 100 feet of any potable groundwater production well.

Once installed, regular maintenance of the detention basin is recommended.

8.0 Closure

The conclusions and recommendations presented are based on the findings and observations made at the time of subsurface test explorations. The recommendations should be considered 'preliminary' since they are based on soil samples only. Supplemental investigation and engineering evaluations may be required following grading plan review.

If during construction, the subsoils exposed appear to be different from those as described in this report, this office should be notified to consider any possible need for revised/updated geotechnical recommendations.

Recommendations provided are based on the assumptions that structural footings will be established exclusively into compacted fill. No footings and/or slabs are allowed straddling over cut/fill transition interface.

Final grading and foundation plans should be reviewed by this office when they become available. Site grading must be performed under inspection by geotechnical representative of this office. Excavated footings should be inspected and approved by soils engineer prior to steel and concrete placement to ensure that foundations are founded into satisfactory soils and excavations are free of loose and disturbed materials.

A pre-grading meeting between grading contractor and soils engineer is recommended prior to construction preferably at the site, to discuss the grading procedures to be implemented and other requirements described in this report to be fulfilled.

This report has been prepared exclusively for the use of the addressee for the project referenced in the context. It shall not be transferred or be used by other parties without a written consent by Soils Southwest, Inc. We cannot be responsible for use of this report by others without inspection and testing of grading operations by our personnel.

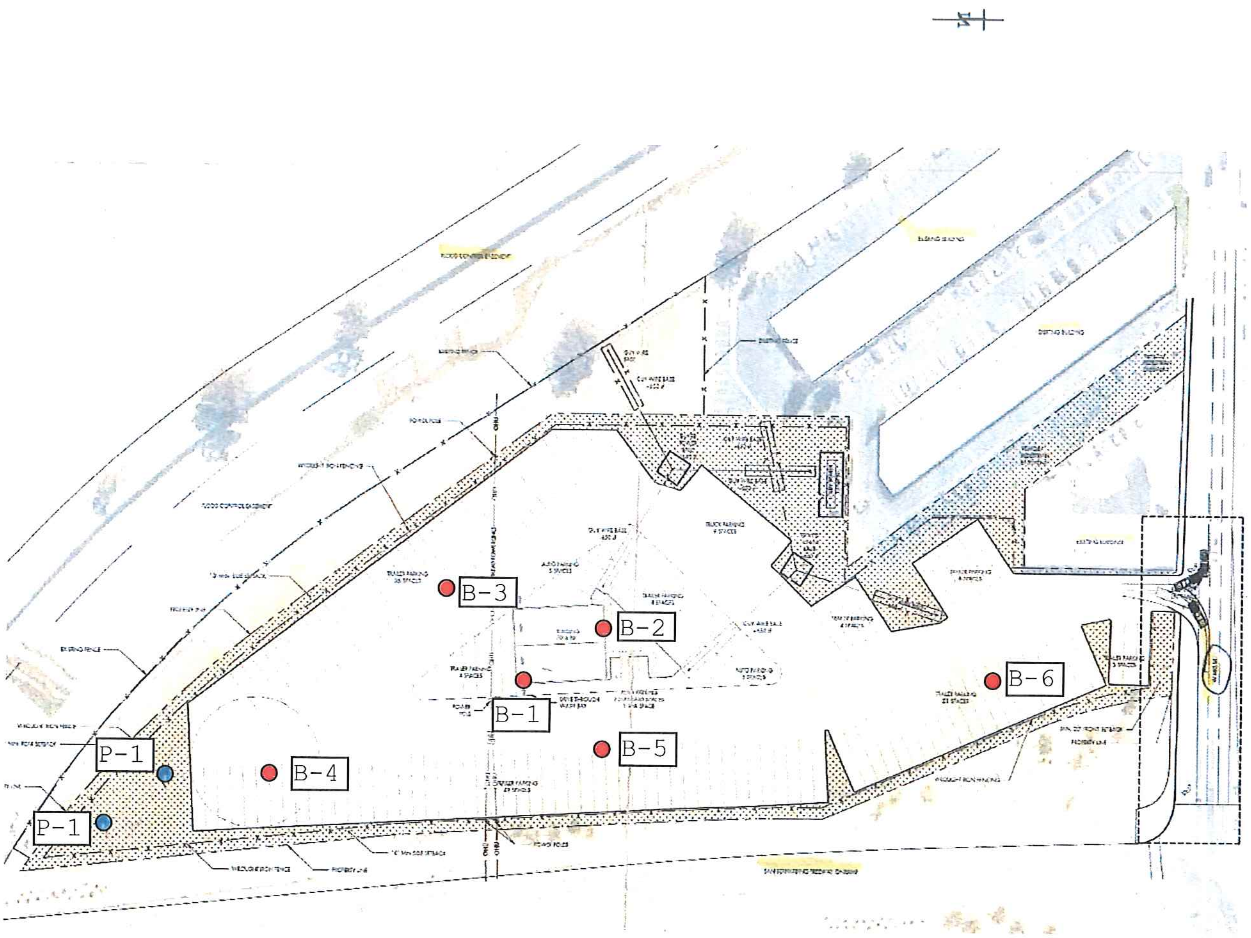
Should the project be delayed beyond one year after the date of this report; the recommendations presented shall be reviewed to consider any possible change in site conditions.

The recommendations presented are based on the assumption that the necessary geotechnical observations and testing during construction will be performed by a representative of this office. The field observations are considered a continuation of the geotechnical investigation performed.

IF ANOTHER FIRM IS RETAINED FOR GEOTECHNICAL OBSERVATIONS AND TESTING, OUR PROFESSIONAL LIABILITY AND RESPONSIBILITY SHALL BE LIMITED TO THE EXTENT THAT SOILS SOUTHWEST, INC. WOULD NOT BE THE GEOTECHNICAL ENGINEER OF RECORD. FURTHER, USE OF THE GEOTECHNICAL RECOMMENDATIONS BY OTHERS WILL RELIEVE SOILS SOUTHWEST, INC. OF ANY LIABILITY THAT MAY ARISE DURING LIFETIME USE OF THE STRUCTURES CONSTRUCTED.

PLOT PLAN AND TEST LOCATIONS
Proposed TEC Equipment
Planned Trailer Facility with Guard Shack and Wash Bays
776 W. Mill Street
City of San Bernardino, California

(Not to Scale)



Legend:
● B-1 Approximate Location of Test Borings
● P-1 Approximate Location of WQMP-BMP Infiltration Test Boring

Plate 1

9.0 APPENDIX A

Field Explorations

For geotechnical evaluations, six (6) exploratory test borings (B-1 to B-6) were made using a hollow-stem auger drilling rig advanced to maximum depth of 51 feet below the existing grade surface. Supplemental two (2) test explorations (P-1and P-2) advanced to maximum 12 feet below grade are included for determination of water infiltration rate for WQMP-BMP design.

Soils encountered during explorations were logged and such were classified by visual observations in accordance with the generally accepted classification system. The field descriptions were modified, where appropriate, to reflect laboratory test results. Approximate test locations are shown on Plate 1.

Where feasible, relatively undisturbed soils were sampled using a drive sampler lined with soil sampling rings. The split barrel steel sampler was driven into the bottom of test excavations at various depths. Soil samples were retained in brass rings of 2.5 inches in diameter and 1.00 inch in height. The central portion of each sample was enclosed in a close-fitting waterproof container for shipment to our laboratory. In addition to undisturbed sample, bulk soil samples were procured as described in the logs.

Logs of test explorations are presented in the following summary sheets that include the description of the soils and/or fill materials encountered.

LOG OF TEST BORINGS
&
WQMP-BMP Test Field Data

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING P-1

Project: Tech Equipment
Job No.: 21001-F/BMP
Logged By: John F.
Boring Diam.: 8" HSA
Date: January 13, 2021

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP			surface weeds SAND - light gray-brown, medium, pebbles, scattered rock fragments, dry
							5	
					GP-SP			- gravely, coarse, rock fragments, scattered rock, dry
							10	
	◣							
								- End of infiltration test boring @ 12.0 ft. - no bedrock - no groundwater - 3" perforated pvc pipe installed with gravel at bottom
							15	
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location

Proposed Trailer Facility with
Guard Shack and Wash Bays
776 W. Mill St.
San Bernardino, California

Plate #

◣ Bulk/Grab sample

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING P-2

Project: Tech Equipment
Job No.: 21001-F/BMP
Logged By: John F.
Boring Diam.: 8" HSA
Date: January 13, 2021

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP	⁘		surface weeds, scattered rocks and cobbles SAND - gray-brown, gravely, medium to medium coarse, rock fragments, occasional rocks and cobbles, damp scattered rock fragments, dry
						⁘	5	
						⁘	10	
	◣					⁘		
								- End of infiltration test boring @ 12.0 ft. - no bedrock - no groundwater - 3" perforated pvc pipe installed with gravel at bottom
							15	
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location

Proposed Trailer Facilty with
Guard Shack and Wash Bays
776 W. Mill St.
San Bernardino, California

Plate #

◣ Bulk/Grab sample

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-1

Project: Tech Equipment | **Job No.:** 21001-F/BMP
Logged By: John F. | **Boring Diam.:** 8" HSA | **Date:** January 13, 2021

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP			scattered weeds and debris
								SAND - light grayish brown, medium, pebbles scattered rock fragments, dry to damp
	◥	2.1	104.3	88.4				- gravely, traces of silt, fine to medium coarse, pebbles, rock fragments, loose, dry
							5	- (Max Dry Density = 118 pcf @ 14.0 %)
	■	2.1	115.6	97.9				- color change to light gray brown, gravely, medium to coarse, rock fragments, scattered rock 1.5", dry, very dense
							10	
45	◤				GP-SP			- gravely, medium coarse to coarse, trace pockets of grayish clay, scattered rock, dense, dry
							15	
							20	
37	◤							- color change to light yellowish gray brown gravely, medium to coarse, rock fragments dense, dry
					SP-SM		25	- slightly silty, fine to medium coarse, pebbles, rock fragments, damp
							30	
54	◤				GP-SP			- color change to tan to light gray, gravely medium to medium coarse, pebbles, rock fragments, very dense
								GRAVEL-rocks and cobbles with some sands
								SAND - gravely medium to coarse with

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location
Proposed Trailer Facility with
Guard Shack and Wash Bays
776 W. Mill St.
San Bernardino, California

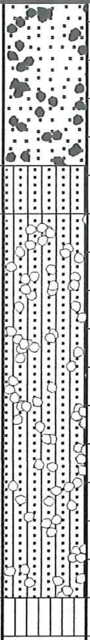
Plate #

◥ Bulk/Grab sample ■ California sampler ◤ Standard penetration test

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-1

Project: Tech Equipment
Job No.: 21001-F/BMP
Logged By: John F.
Boring Diam.: 8" HSA
Date: January 13, 2021

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
								occasional rocks and cobbles
					SM		40	- color change to gray, silty, fine to medium, scattered rock, dry
36	◤				VS			SILT/SAND mixture with scattered pebbles, moist, dense
							45	
							50	
29	◤				ML			SILT - color change to dark gray with traces of clay and very moist to gravely medium to medium coarse sands with rock fragments, dense, very moist
							55	- End of test boring @ 51.0 ft. - no bedrock - no groundwater
							60	
							65	
							70	

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-2

Project: Tech Equipment
Job No.: 21001-F/BMP
Logged By: John F.
Boring Diam.: 8" HSA
Date: January 13, 2021

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP			occasional weeds SAND - light brown, medium, pebble, loose dry to damp
9	◪						5	- color change to light gray-brown, fine to medium, pebbles, rock fragments, dry
	■				SM		10	- NO SAMPLE RECOVERY - color change to gray, silty, fine, loose
	■	1.0	98.3	83.3	SP		15	- color change to light gray, fine to medium coarse, pebbles, rock fragments, scattered 1" rocks and cobbles, very dry
18	◪				VS			SILT/SAND mixture - color change to gray fine to light brown silty sand, damp to moist
					SP		20	- color change to light gray-brown, gravely medium to medium coarse, pebbles and rock fragments
20	◪				SM-ML			- color change to gray to orangish gray brown, silty, fine, pebbles, scattered rock fragments, medium dense, moist
							25	- End of test boring @ 21.0 ft. - no bedrock - no groundwater
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location

Proposed Trailer Facility with
Guard Shack and Wash Bays
776 W. Mill St.
San Bernardino, California

Plate #

◩ Bulk/Grab sample ■ California sampler ◪ Standard penetration test

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-3

Project: Tech Equipment
Job No.: 21001-F/BMP
Logged By: John F.
Boring Diam.: 8" HSA
Date: January 13, 2021

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP			surface weeds, rocks, and cobbles
								SAND - tannish light brown, fine to medium coarse, pebble, rock fragments, dry
					GP-SP		5	- gravely, medium to coarse, rock fragments scattered rocks and cobbles, dry
18	◩							- color change to grayish light brown, gravely, medium to medium coarse with traces of gray silts, rock fragments, rippible granitic materials, medium dense
							10	
15	◩							- gravely medium to medium coarse, rock fragments, scattered rocks, medium dense, dry
								- End of test boring @ 11.0 ft. - no bedrock - no groundwater
							15	
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location
Proposed Trailer Facility with
Guard Shack and Wash Bays
776 W. Mill St.
San Bernardino, California

Plate #

◪ Bulk/Grab sample ■ California sampler ◩ Standard penetration test

LOG OF BORING B-4

Project: Tech Equipment **Job No.:** 21001-F/BMP

Logged By: John F. **Boring Diam.:** 8" HSA **Date:** January 13, 2021

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
	◣				GP-SP	▨		surface weeds, scat organic debris and other debris
						▨		SAND - light brown to light gray-brown, small traces of silt, fine to coarse pebbles, rock fragments
						▨	5	
13	◢					▨		
								- End of test boring @ 6.0 ft. - no bedrock - no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location

Proposed Trailer Facilty with
Guard Shack and Wash Bays
776 W. Mill St.
San Bernardino, California

Plate #

◣ Bulk/Grab sample ■ California sampler ◢ Standard penetration test

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-5

Project: Tech Equipment
Job No.: 21001-F/BMP
Logged By: John F.
Boring Diam.: 8" HSA
Date: January 13, 2021

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP			low weeds and scattered debris SAND - light brown, medium, pebbles, dry
	■	1.1	104.7	88.8	GP-SP			- color change to light yellow-brown, gravely, fine to medium coarse, pebble, rock fragments, very dry, low to medium dense
12	◪				SP		5	- very fine sand to gravely medium coarse sand with rock fragments and rock 1", very dry
25	◪				GP-SP		10	- gravely coarse with pockets of silt, rock fragments
								- End of test boring @ 11.0 ft. - no bedrock - no groundwater
							15	
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location
Proposed Trailer Facilty with
Guard Shack and Wash Bays
776 W. Mill St.
San Bernardino, California

Plate #

◩ Bulk/Grab sample ■ California sampler ◪ Standard penetration test

Soils Southwest, Inc.
897 Via Lata, Suite N
Colton, CA 92324
(909) 370-0474 Fax (909) 370-3156

LOG OF BORING B-6

Project: Tech Equipment
Job No.: 21001-F/BMP
Logged By: John F.
Boring Diam.: 8" HSA
Date: January 13, 2021

Standard Penetration (Blows per Ft.)	Sample Type	Water Content in %	Dry Density in PCF	Percent Compaction	Unified Classification System	Graphic	Depth in Feet	Description and Remarks
					SP-SM	▨		surface weeds
						▨		SAND - gray-brown, slightly silty, fine, scattered pebbles
10	◪				SP	▨		- color change to light gray, fine to medium pebbles, rock fragments, dry, low density
							5	- End of test boring @ 4.0 ft. - no bedrock - no groundwater
							10	
							15	
							20	
							25	
							30	

Groundwater: n/a
Approx. Depth of Bedrock: n/a
Datum: n/a
Elevation: n/a

Site Location

Proposed Trailer Facilty with
Guard Shack and Wash Bays
776 W. Mill St.
San Bernardino, California

Plate #

◥ Bulk/Grab sample
■ California sampler
◪ Standard penetration test

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
░	Poorly graded sand
▒	Poorly graded gravel and sand
▦	Poorly graded sand with silt
▥	Silty sand
▩	Variable sand and silt mix
▥	Silt
▥	Poorly graded silty fine sand
Soil Samplers	
◥	Bulk/Grab sample
■	California sampler
◤	Standard penetration test

Notes:

1. Exploratory borings were drilled on January 13, 2021 using a 4-inch diameter continuous flight power auger.
2. No free water was encountered at the time of drilling or when re-checked the following day.
3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs.

Percolation Test Data Sheet

Project:	Tec Equipment	Project No:	21001-BMP	Date:	1-13-21
Test Hole No:	P-	Tested By:	A.P.		
Depth of Test Hole, D_T:	146"	USCS Soil Classification:			
Test Hole Dimensions (inches)			Length	Width	
Diameter (if round)=		Sides (if rectangular)=			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	8:58	9:22	25	122"	146"	24"	y
2	9:24	9:49	25	122"	144"	22"	y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_0 Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	9:51	10:01	10	119"	137	18"	
2	10:03	10:13	10	119"	137	18"	
3	10:15	10:25	10	119"	137	18"	
4	10:27	10:37	10	119"	137	18"	
5	10:39	10:49	10	119"	137	18"	
6	10:51	11:01	10	119"	137	18"	
7							
8							
9							
10							
11							
12							
13							
14							
15							

COMMENTS:

Percolation Test Data Sheet

1st
3/ FRWY

Project:	TEC EQUIPMENT	Project No:	21001-BMP	Date:	1-13-21
Test Hole No:	P-2	Tested By:			
Depth of Test Hole, D_T:	146"	USCS Soil Classification:			

Test Hole Dimensions (inches)		Length	Width	
Diameter (if round)=		Sides (if rectangular)=		

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	9:06	9:31	25	122"	146"	24	y
2	9:33	9:58	25	122	146"	24	y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_0 Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	10:00	10:10	10	116½	136	19½	
2	10:12	10:22	10	116½	135½	19	
3	10:23	10:33	10	116½	135	18½	
4	10:35	10:45	10	116½	135½	19	
5	10:47	10:57	10	116½	135½	19	
6	10:59	11:09	10	116½	135½	19	
7							
8							
9							
10							
11							
12							
13							
14							
15							

COMMENTS:

10.0 APPENDIX B

Laboratory Test Programs

Laboratory tests were conducted on representative soils for the purpose of classification and for the determination of the physical properties and engineering characteristics. The number and selection of the types of testing for a given study are based on the geotechnical conditions of the site. A summary of the various laboratory tests performed for the project is presented below.

Moisture Content and Dry Density (D2937):

Data obtained from these tests, performed on undisturbed samples are used to aid in the classification and correlation of the soils and to provide qualitative information regarding soil strength and compressibility.

Direct Shear (D3080):

Data obtained from this test performed at increased and field moisture conditions on relatively remolded soil sample is used to evaluate soil shear strengths. Samples contained in brass sampler rings, placed directly on test apparatus are sheared at a constant strain rate of 0.002 inch per minute under saturated conditions and under varying loads appropriate to represent anticipated structural loadings. Shearing deformations are recorded to failure. Peak and/or residual shear strengths are obtained from the measured shearing load versus deflection curve. Test results, plotted on graphical form, are presented on Plate B-1 of this section.

Consolidation (D2835):

Drive-tube samples are tested at their field moisture contents and at increased moisture conditions since the soils may become saturated during lifetime use of the planned structure.

Data obtained from this test performed on relatively undisturbed and/or remolded samples, were used to evaluate the consolidation characteristics of foundation soils under anticipated foundation loadings. Preparation for this test involved trimming the sample, placing it in one-inch high brass ring, and loading it into the test apparatus which contained porous stones to accommodate drainage during testing. Normal axial loads are applied at a load increment ratio, successive loads being generally twice the preceding.

Soil samples are usually under light normal load conditions to accommodate seating of the apparatus. Samples were tested at the field moisture conditions at a predetermined normal load. Potentially moisture sensitive soil typically demonstrated significant volume change with the introduction of free water. The results of the consolidation tests are presented in graphical forms on Plate B-2.

Laboratory Test Results

Table I: In-Situ Moisture-Density (ASTM D2216)

Test Boring No.	Sample Depth, ft.	Dry Density, pcf.	Moisture Content, %
1	3	104.3	2.1
1	8	115.6	2.1
2	5	No Recovery	--
2	10	98.25	1.0
5	2	104.7	1.0

Table II: Max. Density/Optimum Moisture Content (ASTM D1557-91)

Sample Location, @ Depth, ft.	Max. Dry Density, pcf	Opt. Moisture (%)
B-1 @ 3-5 SAND –silty, gravely, fine to medium coarse with, rock fragments	118.0	14.0

Table III: Direct Shear (ASTM D3080)

Test Boring & Sample Depth (ft)	Test Condition	Cohesion (PSF)	Friction (Degree)
B-1 @ 3-5	Remolded to 90%	150	36

Table IV: Consolidation (D2435)

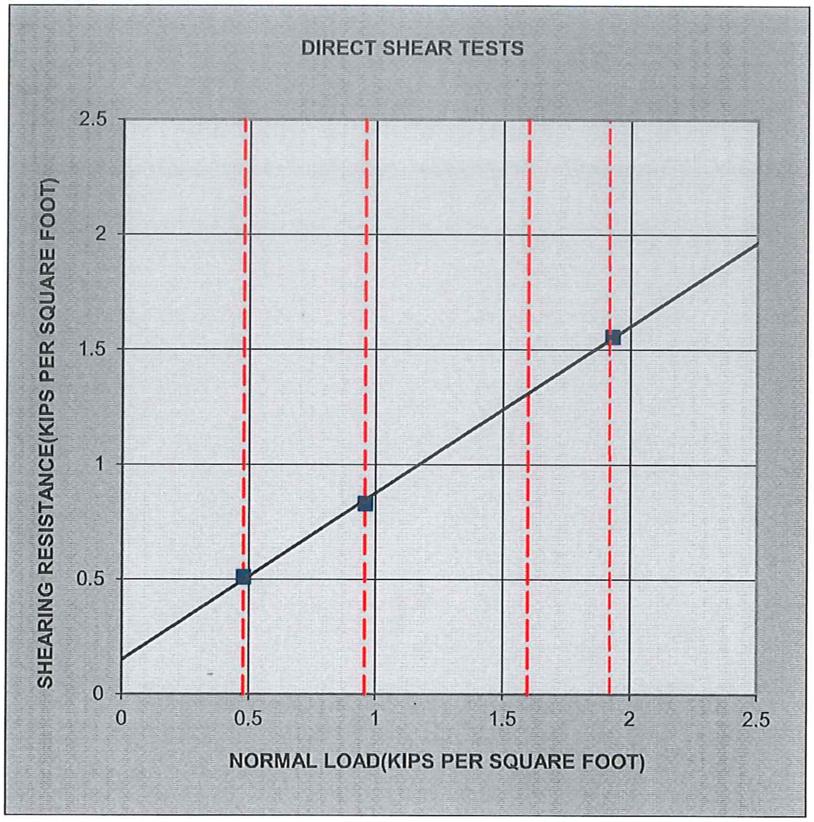
Boring B #1	Depth (ft.)	Consolidation prior to saturation (%) @ 2 kips	Hydro collapse (%) @ 2 kips	Total Consolidation (%@ 8 kips) (saturated)
(remolded)	3-5	0.5	0.1	1.5

E. Table V: Sand Equivalent, SE (ASTM D2419)

Sample Location @ depth, ft.	Sand Equivalent Average
B-4 @ 0-5'	76.41

F. Table VI: Soils Expansion Index, EI. (ASTM D4829)

Sample Location & Soils Type	Soil Expansion Index, EI	Expansion Potential
B-1 @ 3-5' SAND –silty, gravely, fine to medium coarse with, rock fragments	10	“very low”



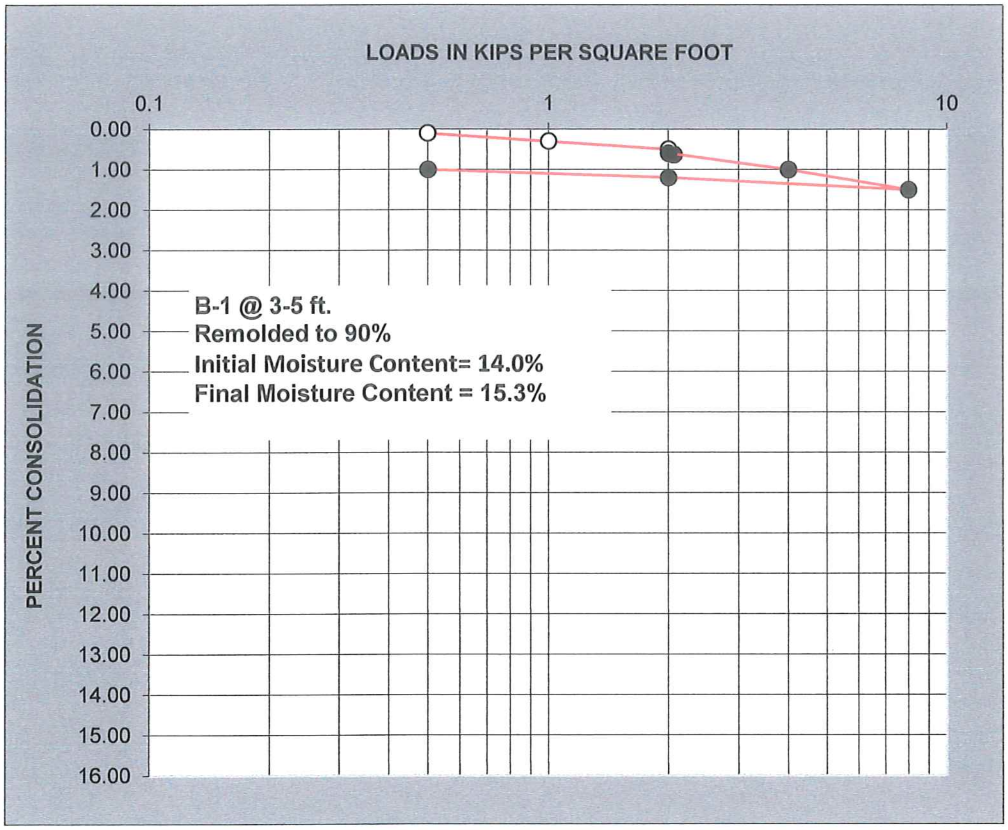
SYMBOL	LOCATION	DEPTH (FT)	TEST CONDITION	COHESION (psf)	FRICTION (degree)
■	B-1	3 to 5	Remolded to 90%	150.07	35.98

Proposed Trailer Facility, Guardshack, and Wash Bays 776 W. Mill St. San Bernardino, California	PROJECT NO.	21001-F
	PLATE	B-1

SOILS SOUTHWEST, INC.

Consulting Foundation Engineers

CONSOLIDATION TESTS



● **WATER PERMITTED TO CONTACT SAMPLE**

PROJECT	Proposed Trailer Facility,Guard Shack, and Wash Bay` 776 W. Mill Street, San Bernardino			
PROJECT NO.	21001-F	PLATE	B-2	

SOILS SOUTHWEST INC.

Consulting Foundation Engineers

SAND EQUIVALENT TEST

Test Date: January 26,2021

Project No.: 21001-F

Job Name: Tech Equipment-776 W. Mill St., San Bernardino

Sample Location: B-4 @ 0-5'

Sample by: JF Tested by: RM

LABORATORY DATA

SAMPLE NO.	1	2	3	4
TIME START	1:53	1:58	2:03	
TIME SOAK (10 min.)	2:03	2:08	2:13	
TIME AT LEVEL 15ML	2:05	2:10	2:15	
TIME of READING (20-min)	2:25	2:30	2:35	
FINE, ML	4.6	4.7	4.7	
COARSE, ML	3.5	3.5	3.7	
SE = 100x (coarse/fine)	76.08	74.46	78.7	
SE Average	76.41			

Soil Description: SP fine to medium coarse sand with small traces of silts

SOILS SOUTHWEST, INC.
CONSULTING FOUNDATION
ENGINEERS

GRAIN SIZE DISTRIBUTION ASTM D422

Project: Tech Equipment **Job #** 21001-F

Location: 776 W. Mill St. San Bernardino **Boring No:** B-4@0-5 **Sample No:** 2

Description of Soil: SP-fine to medium coarse sands

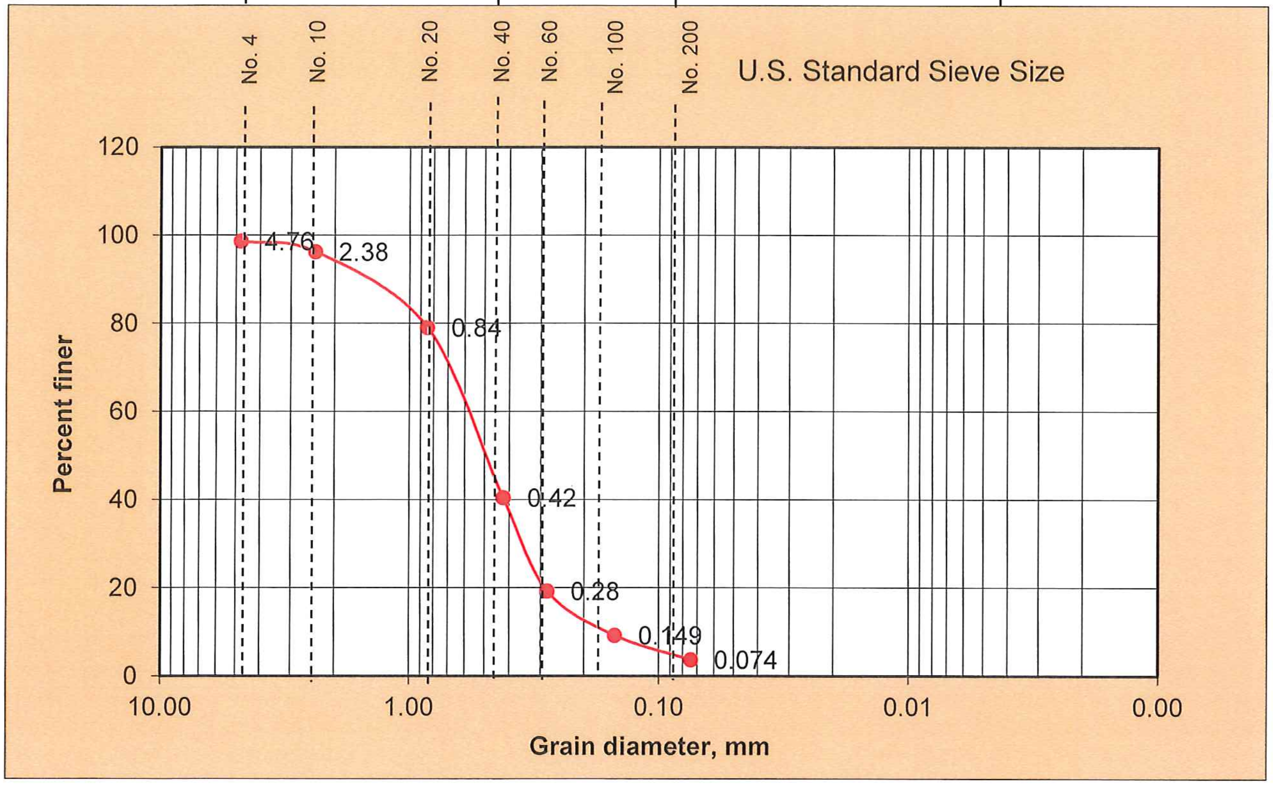
Date of Sample: 1/13/2021

Tested By: RM **Date of Testing:** 1/26/2021

Sieve No.	Sieve Openings in mm	Percent Finer
4	4.76	98.70
10	2.38	96.30
20	0.84	79.10
40	0.42	40.50
60	0.28	19.30
100	0.149	9.30
200	0.074	3.80

Grain Size	% Retained
Gravel	1
Med. to Crs	54
Fines	40
Silts	5

Gravel	Sand			
	Coarse to Medium	Fine	Silt	Clay



Visual Soil Description : SP- fine to medium coarse with small traces of silts

Soil Classification: SP

System: USC

SOILS SOUTHWEST INC.
Consulting Foundation Engineers

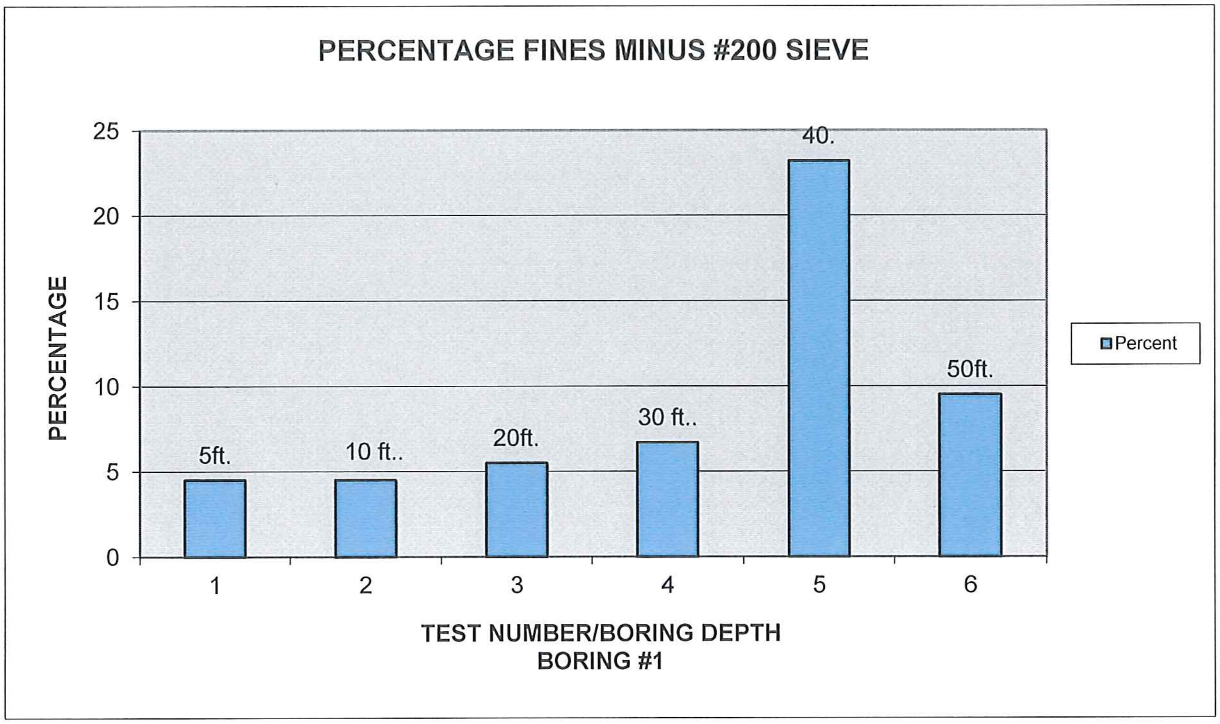
PERCENTAGE FINES ANAYLYSIS

Job Number: 21001-F
Project Name: TEC Equipment

Sample Location: B-1 and B-8 for 5ft

Project Location: 776 W. Mill St
San Bernardino, CA
Sample Date: 1-13-21

Boring Depth (Feet)	Percent Fines Minus #40 Sieve
5	4.5
10	4.5
20	5.5
30	6.7
40	23.2
50	9.5



PERCENTAGE FINES ANAYLYSIS

Job Number: 21001-F
Project Name: TEC Equipment

Project Location: 776 W. Mill St
San Bernardino, CA

Sample Location: B-1
Sample Date: 1-13-21

Boring/Depth (ft): B1 10
Moisture Content (%)
(A) Container + Sample (grms) 923.7
(B) Container (grms) 146.3
(C) Sample (A-B) (grms) 777.4

	A	B
Sieve Size	Weight Retained in Grams	Percent Retained
No. 200	742.6	95.52
PAN	34.8	4.48
TOTAL (C)	777.40	

Boring/Depth (ft):B1 20
Moisture Content (%)
(A) Container + Sample (grms) 786.2
(B) Container (grms) 146.3
(C) Sample (A-B) (grms) 639.9

	A	B
Sieve Size	Weight Retained in Grams	Percent Retained
No. 200	604.6	94.48
PAN	35.3	5.52
TOTAL (C)	639.9	

Boring/Depth (ft):B1 30
Moisture Content (%)
(A) Container + Sample (grms) 708.7
(B) Container (grms) 146.3
(C) Sample (A-B) (grms) 562.4

	A	B
Sieve Size	Weight Retained in Grams	Percent Retained
No. 200	524.8	93.31
PAN	37.6	6.69
TOTAL (C)	562.4	

Boring/Depth (ft):B1 40
Moisture Content (%)
(A) Container + Sample (grms) 826.6
(B) Container (grms) 146.3
(C) Sample (A-B) (grms) 680.3

	A	B
Sieve Size	Weight Retained in Grams	Percent Retained
No. 200	522.3	76.77
PAN	158	23.23
TOTAL (C)	680.3	

Boring/Depth (ft):B1 50
Moisture Content (%)
(A) Container + Sample (grms) 678.7
(B) Container (grms) 146.3
(C) Sample (A-B) (grms) 532.4

	A	B
Sieve Size	Weight Retained in Grams	Percent Retained
No. 200	482	90.53
PAN	50.4	9.47
TOTAL (C)	532.4	

Boring/Depth (ft):_
Moisture Content (%)
(A) Container + Sample (grms)
(B) Container (grms)
(C) Sample (A-B) (grms)

	A	B
Sieve Size	Weight Retained in Grams	Percent Retained
No. 200		#DIV/0!
PAN		#DIV/0!
TOTAL (C)	0	

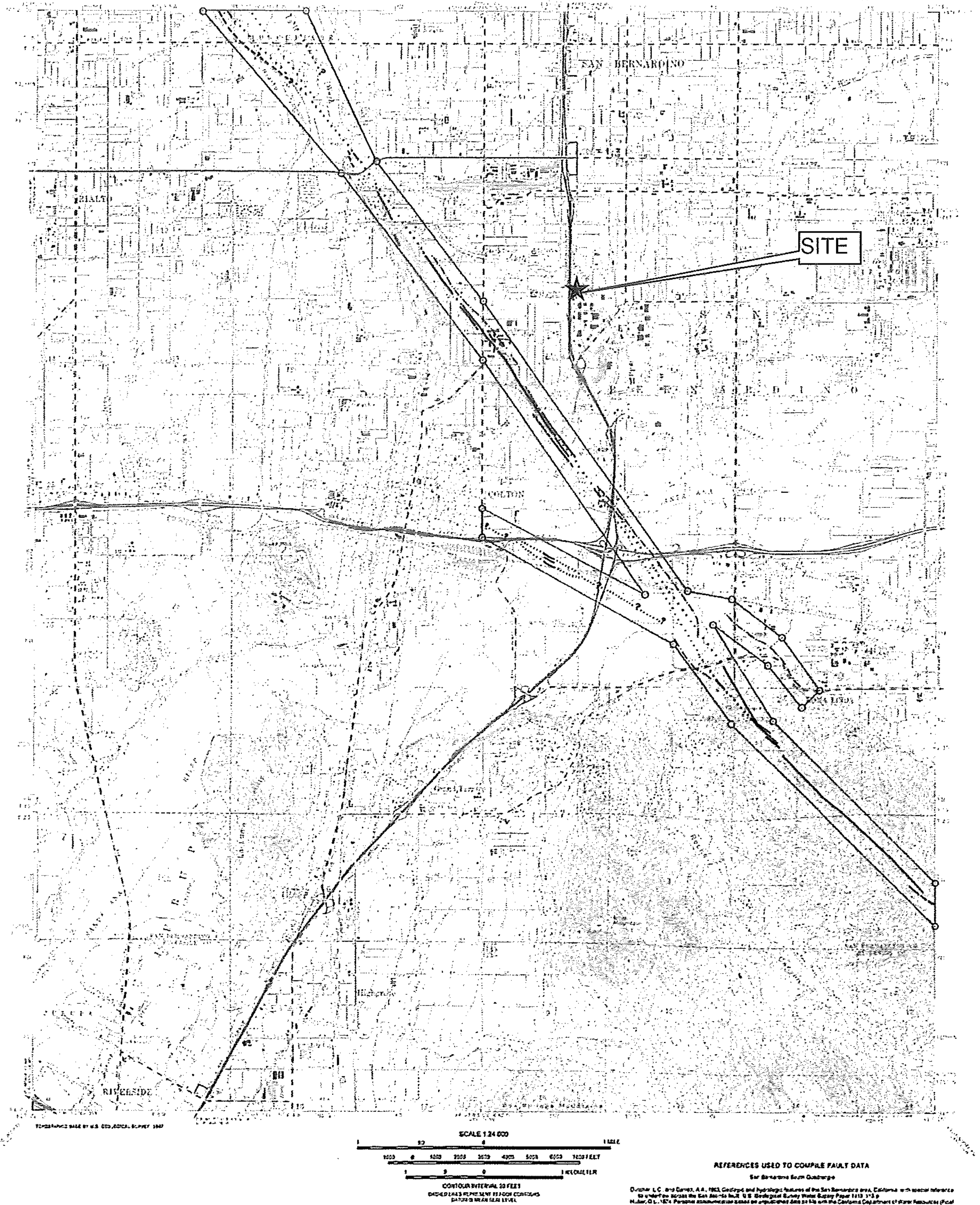
APPENDIX C

Supplemental Seismic Design Parameters

CALIFORNIA DIVISION OF MINES AND GEOLOGY
THOMAS E. GAY JR., ACTING STATE GEOLOGIST

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF CONSERVATION

SAN BERNARDINO SOUTH QUADRANGLE
CALIFORNIA
7.5 MINUTE SERIES (TOPOGRAPHIC)



MAP EXPLANATION

Potentially Active Faults

Faults considered to have been active during Quaternary time; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by creep or possible creep.

Aerial photo lineaments (not field checked); based on youthful geomorphic and other features believed to be the results of Quaternary faulting.

Special Studies Zone Boundaries

These are delineated as straight-line segments that connect encircled turning points so as to define special studies zone segments.

Seaward projection of zone boundary.

STATE OF CALIFORNIA
SPECIAL STUDIES ZONES

Delineated in compliance with
Chapter 7.5, Division 2 of the California Public Resources Code

SAN BERNARDINO SOUTH QUADRANGLE

REVISED OFFICIAL MAP

Effective: January 1, 1977

T. E. Gay Jr. Acting State Geologist

REFERENCES USED TO COMPILE FAULT DATA

San Bernardino South Quadrangle

Dutcher, L.C., and Garrett, A.A., 1963, Geologic and hydrologic features of the San Bernardino area, California, with special reference to underflow across the San Jacinto fault: U.S. Geological Survey Water-Supply Paper 1419, 114 p.
Huber, O.L., 1974, Personal communication based on unpublished data on file with the California Department of Water Resources (Final geologic report, Santa Ana Valley pipeline -- Devil Canyon Power Plant to Perris Reservoir)
Sharp, R.V., 1972, Map showing recently active breaks along the San Jacinto fault zone between the San Bernardino area and Borrego Valley, California: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-675
Gae, M., 1974, Lineament based on aerial photographic interpretation.
Sam, K. and others, 1973, Geologic investigations of portions of the San Jacinto fault zone, San Bernardino Valley, California, in W.A. Elders (Editor), Geologic investigations of the San Jacinto fault zone, and aspects of the socio-economic impact of earthquakes in the Riverside-San Bernardino area, California: University of California, Riverside, Campus Museum Contributions No. 2, p. 1-48

IMPORTANT - PLEASE NOTE

1) *This map may not show all potentially active faults, either within the special studies zones or outside their boundaries.*
2) Faults shown are the basis for establishing the boundaries of the special studies zones.
3) The identification of these potentially active faults and the location of such fault traces are based on the best available data. Traces have been drawn as accurately as possible at this map scale, however, the quality of data used is highly varied. The faults shown have not been field checked during this map compilation.
4) Fault information on this map is not sufficient to serve as a substitute for information developed by the special studies that may be required under Chapter 7.5, Division 2, Section 2623 of the California Public Resources Code.

Ground Motion Interpolator (2008)

Longitude: -117.300346

Latitude: 34.092306

Site Condition (VS30): 270 (180-1050 m/sec)

Return Period:

2% in 50 years 10% in 50 years

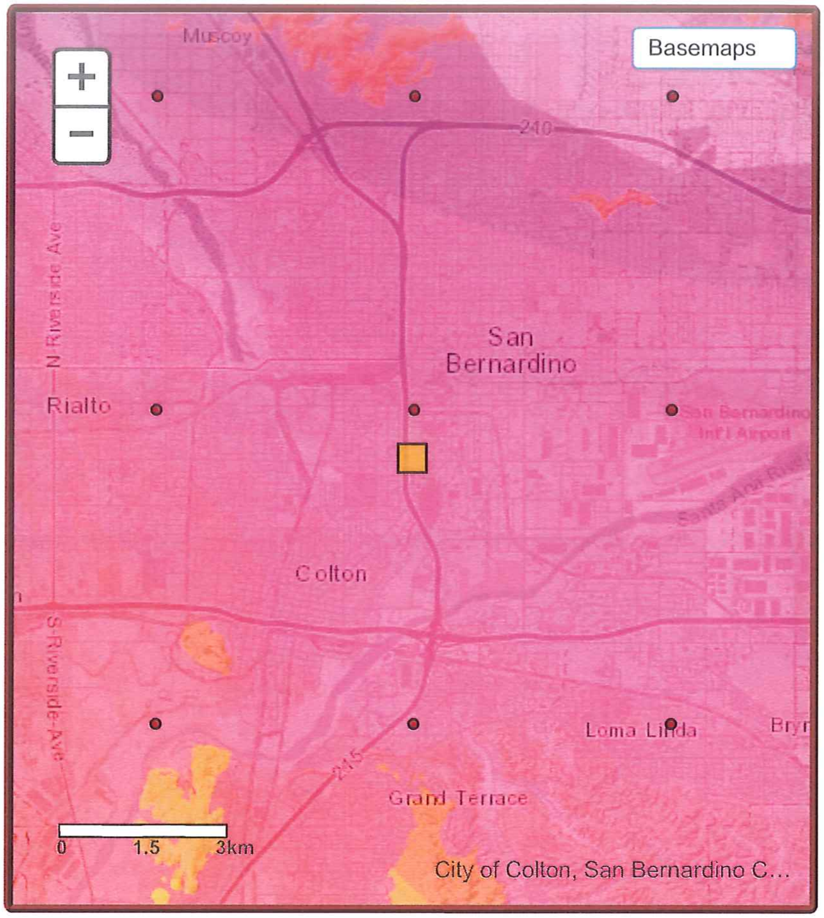
Spectral Acceleration:

PGA 0.2 second SA 1.0 second SA

Submit

Inputs:	**Result:**
-117.300346, 34.092306 vs30: 270 m/sec 10% in 50 years PGA	0.663 g

Information and Disclaimer



U.S. Geological Survey - Earthquake Hazards Program

2008 National Seismic Hazard Maps - Source Parameters

New Search

Distance in Miles	Name	State	Pref Slip Rate (mm/yr)	Dip (degrees)	Dip Dir	Slip Sense	Rupture Top (km)	Rupture Bottom (km)	Length (km)
0.70	San Jacinto;SBV+SJV	CA	n/a	90	V	strike slip	0	16	88
0.70	San Jacinto;SBV+SJV+A	CA	n/a	90	V	strike slip	0	16	134
0.70	San Jacinto;SBV+SJV+A+C	CA	n/a	90	V	strike slip	0	17	181
0.70	San Jacinto;SBV+SJV+A+CC+B	CA	n/a	90	V	strike slip	0.1	15	215
0.70	San Jacinto;SBV+SJV+A+CC+B+SM	CA	n/a	90	V	strike slip	0.1	15	241
0.70	San Jacinto;SBV+SJV+A+CC	CA	n/a	90	V	strike slip	0	16	181
0.70	San Jacinto;SBV	CA	6	90	V	strike slip	0	16	45
5.61	S. San Andreas;BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	85		strike slip	0.1	13	390
5.61	S. San Andreas;CH+CC+BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	86		strike slip	0.1	13	512
5.61	S. San Andreas;NSB+SSB+BG+CO	CA	n/a	79		strike slip	0.2	12	206
5.61	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB	CA	n/a	90	V	strike slip	0.1	13	377
5.61	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB	CA	n/a	90	V	strike slip	0.1	13	421
5.61	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB+BG	CA	n/a	86		strike slip	0.1	13	479
5.61	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	86		strike slip	0.1	13	548
5.61	S. San Andreas;BB+NM+SM+NSB	CA	n/a	90	V	strike slip	0	14	220
5.61	S. San Andreas;SM+NSB	CA	n/a	90	V	strike slip	0	13	133

U.S. Geological Survey - Earthquake Hazards Program

2008 National Seismic Hazard Maps - Source Parameters

New Search

Fault Name	State
San Jacinto;SBV+SJV	**California**

GEOMETRY	
Dip (degrees)	90
Dip direction	V
Sense of slip	strike slip
Rupture top (km)	0
Rupture bottom (km)	16
Rake (degrees)	180
Length (km)	88

MODEL VALUES		
Slip Rate	n/a	
Probability of activity	1	
	ELLSWORTH	HANKS
Minimum magnitude	6.5	6.5
Maximum magnitude	7.35	7.27
b-value	0.8	0.8

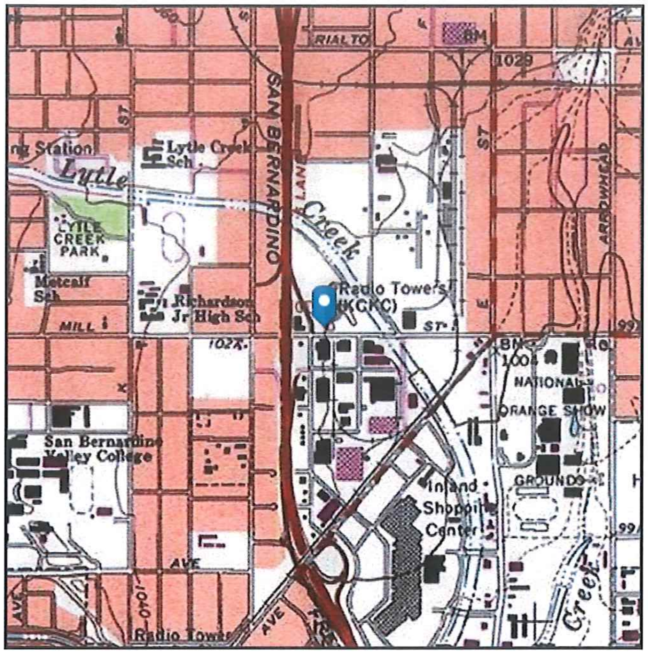
Fault Model	Deformation	Char Rate[1]	GR-a-value[1]	Weight

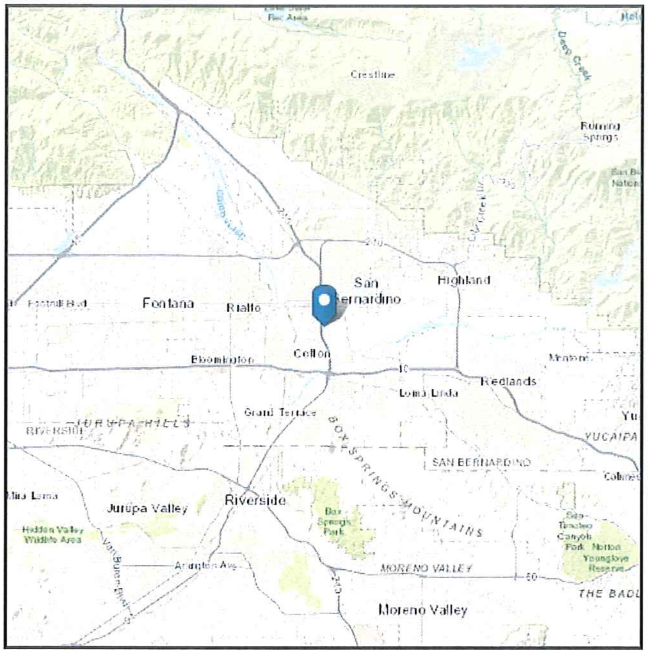
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: III
Soil Class: D - Stiff Soil

Elevation: 1022.53 ft (NAVD 88)
Latitude: 34.092306
Longitude: -117.300346





Seismic

Site Soil Class: D - Stiff Soil

Results:

S_S :	2.391	S_{D1} :	N/A
S_1 :	0.958	T_L :	8
F_a :	1	PGA :	1.007
F_v :	N/A	PGA_M :	1.107
S_{MS} :	2.391	F_{PGA} :	1.1
S_{M1} :	N/A	I_e :	1.25
S_{DS} :	1.594	C_v :	1.5

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Tue Jan 05 2021

Date Source: USGS Seismic Design Maps

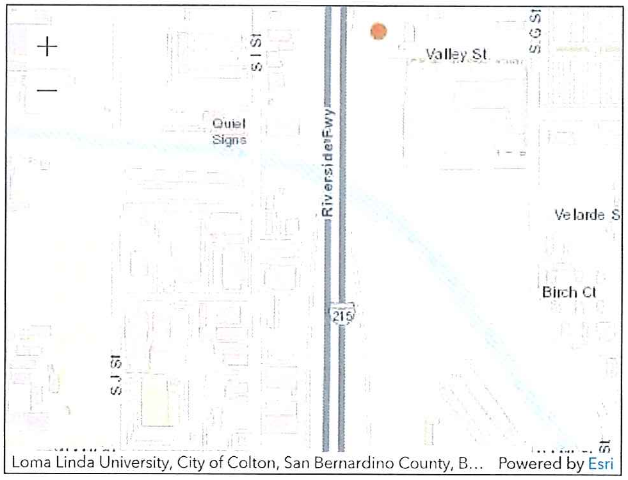
CA

Groundwater Level Report

Station 340978N1173012W001

Station Data | Groundwater Level Data

State Well Number:	01S04W09J001S
Local Well Name:	
Site Code:	340978N1173012W001
Latitude (NAD83):	34.0978
Longitude (NAD83):	-117.3012
Basin Subbasin Name (Code):	San Bernardino (8-002.06)
Well Use Type:	Unknown
Well Status:	Active
WCR Number:	
Reference Point Elevation (NAVD88 ft):	1032.550
Ground Surface Elevation (NAVD88 ft):	1032.550
Well Depth (feet bgs):	
Perforated Interval Depths (feet bgs):	



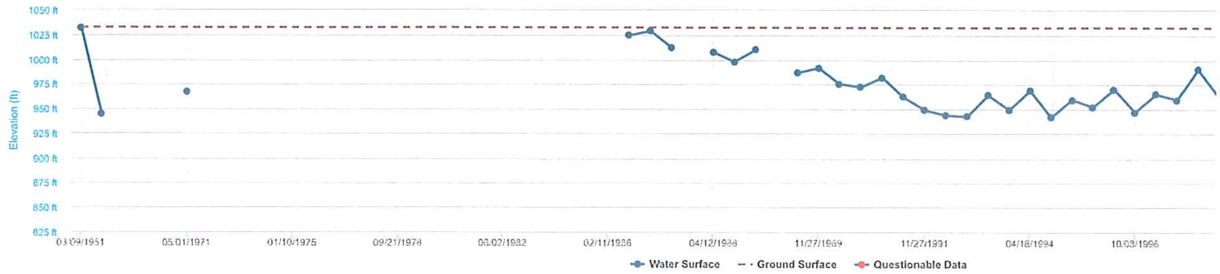
Loma Linda University, City of Colton, San Bernardino County, B… Powered by Esri

Groundwater Level Report

Station 340978N1173012W001

Station Data **Groundwater Level Data**

Groundwater Levels for Well 340978N1173012W001



Download Data

Measurement Date (PST)	Reference Point Elevation	Ground Surface Elevation	Distance from RP to WS	Groundwater Elevation	Ground Surface to Water Surface	Measurement Issue	Collecting Agency	Water Level Measurement Comments
03/09/1951 00:00:00	1032.550	1032.550	0.2	1032.35	0.2		Department of Water Resou...	
10/22/1968 00:00:00	1032.550	1032.550	87.8	944.75	87.8		Department of Water Resou...	
05/01/1971 00:00:00	1032.550	1032.550	65	967.55	65		Department of Water Resou...	
06/20/1986 00:00:00	1032.550	1032.550	8.08	1024.47	8.08		Department of Water Resou...	
11/21/1986 00:00:00	1032.550	1032.550	3.6	1028.95	3.6		Department of Water Resou...	
06/18/1987 00:00:00	1032.550	1032.550	20.45	1012.1	20.45		Department of Water Resou...	
04/12/1988 00:00:00	1032.550	1032.550	24.8	1007.75	24.8		Department of Water Resou...	
06/29/1988 00:00:00	1032.550	1032.550	34.76	997.79	34.76		Department of Water Resou...	
11/30/1988 00:00:00	1032.550	1032.550	22.46	1010.09	22.46		Department of Water Resou...	
09/22/1989 00:00:00	1032.550	1032.550	45.7	986.85	45.7		Department of Water Resou...	
11/27/1989 00:00:00	1032.550	1032.550	40.75	991.8	40.75		Department of Water Resou...	
06/25/1990 00:00:00	1032.550	1032.550	56.95	975.6	56.95		Department of Water Resou...	
06/29/1990 00:00:00	1032.550	1032.550	60.25	972.3	60.25		Department of Water Resou...	
11/28/1990 00:00:00	1032.550	1032.550	50.54	982.01	50.54		Department of Water Resou...	
06/18/1991 00:00:00	1032.550	1032.550	70.26	962.29	70.26		Department of Water Resou...	
11/27/1991 00:00:00	1032.550	1032.550	83.75	948.8	83.75		Department of Water Resou...	
06/17/1992 00:00:00	1032.550	1032.550	88.82	943.73	88.82		Department of Water Resou...	
10/28/1992 00:00:00	1032.550	1032.550	90.03	942.52	90.03		Department of Water Resou...	
04/14/1993 00:00:00	1032.550	1032.550	68.48	964.07	68.48		Department of Water Resou...	
10/19/1993 00:00:00	1032.550	1032.550	83.35	949.2	83.35		Department of Water Resou...	
04/18/1994 00:00:00	1032.550	1032.550	63.97	968.58	63.97		Department of Water Resou...	
10/24/1994 00:00:00	1032.550	1032.550	90.96	941.59	90.96		Department of Water Resou...	
04/19/1995 00:00:00	1032.550	1032.550	73.09	959.46	73.09		Department of Water Resou...	

00:00:00							Water Resou...
04/22/1996 00:00:00	1032.550	1032.550	62.46	970.09	62.46		Department of Water Resou...

1 to 25 of 41 records

‹ 1 2 ›

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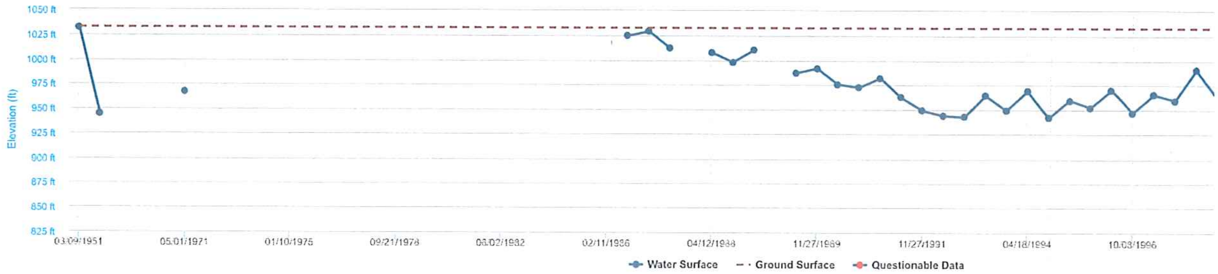
text

Groundwater Level Report

Station 340978N1173012W001

Station Data **Groundwater Level Data**

Groundwater Levels for Well 340978N1173012W001



Download Data

Measurement Date (PST)	Reference Point Elevation	Ground Surface Elevation	Distance from RP to WS	Groundwater Elevation	Ground Surface to Water Surface	Measurement Issue	Collecting Agency	Water Level Measurement Comments
10/08/1996 00:00:00	1032.550	1032.550	85.79	946.76	85.79		Department of Water Resou...	
04/15/1997 00:00:00	1032.550	1032.550	67.54	965.01	67.54		Department of Water Resou...	
10/29/1997 00:00:00	1032.550	1032.550	73.02	959.53	73.02		Department of Water Resou...	
04/15/1998 00:00:00	1032.550	1032.550	42.02	990.53	42.02		Department of Water Resou...	
10/20/1998 00:00:00	1032.550	1032.550	70.56	961.99	70.56		Department of Water Resou...	
04/13/1999 00:00:00	1032.550	1032.550	51.68	980.87	51.68		Department of Water Resou...	
10/19/1999 00:00:00	1032.550	1032.550	88.64	943.91	88.64		Department of Water Resou...	
04/13/2000 00:00:00	1032.550	1032.550	80.61	951.94	80.61		Department of Water Resou...	
04/18/2005 00:00:00	1032.550	1032.550	114.05	918.5	114.05		Department of Water Resou...	
11/16/2005 00:00:00	1032.550	1032.550	129.75	902.8	129.75		Department of Water Resou...	
04/26/2006 00:00:00	1032.550	1032.550	116.77	915.78	116.77		Department of Water Resou...	
10/25/2006 00:00:00	1032.550	1032.550	157.84	874.71	157.84		Department of Water Resou...	
04/17/2007 00:00:00	1032.550	1032.550	152.57	879.98	152.57		Department of Water Resou...	
10/29/2007 00:00:00	1032.550	1032.550	164.12	868.43	164.12		Department of Water Resou...	
04/14/2008 00:00:00	1032.550	1032.550	156.43	876.12	156.43		Department of Water Resou...	
10/21/2008 00:00:00	1032.550	1032.550	176.26	856.29	176.26		Department of Water Resou...	

26 to 41 of 41 records

‹ 1 2 ›

APPENDIX D

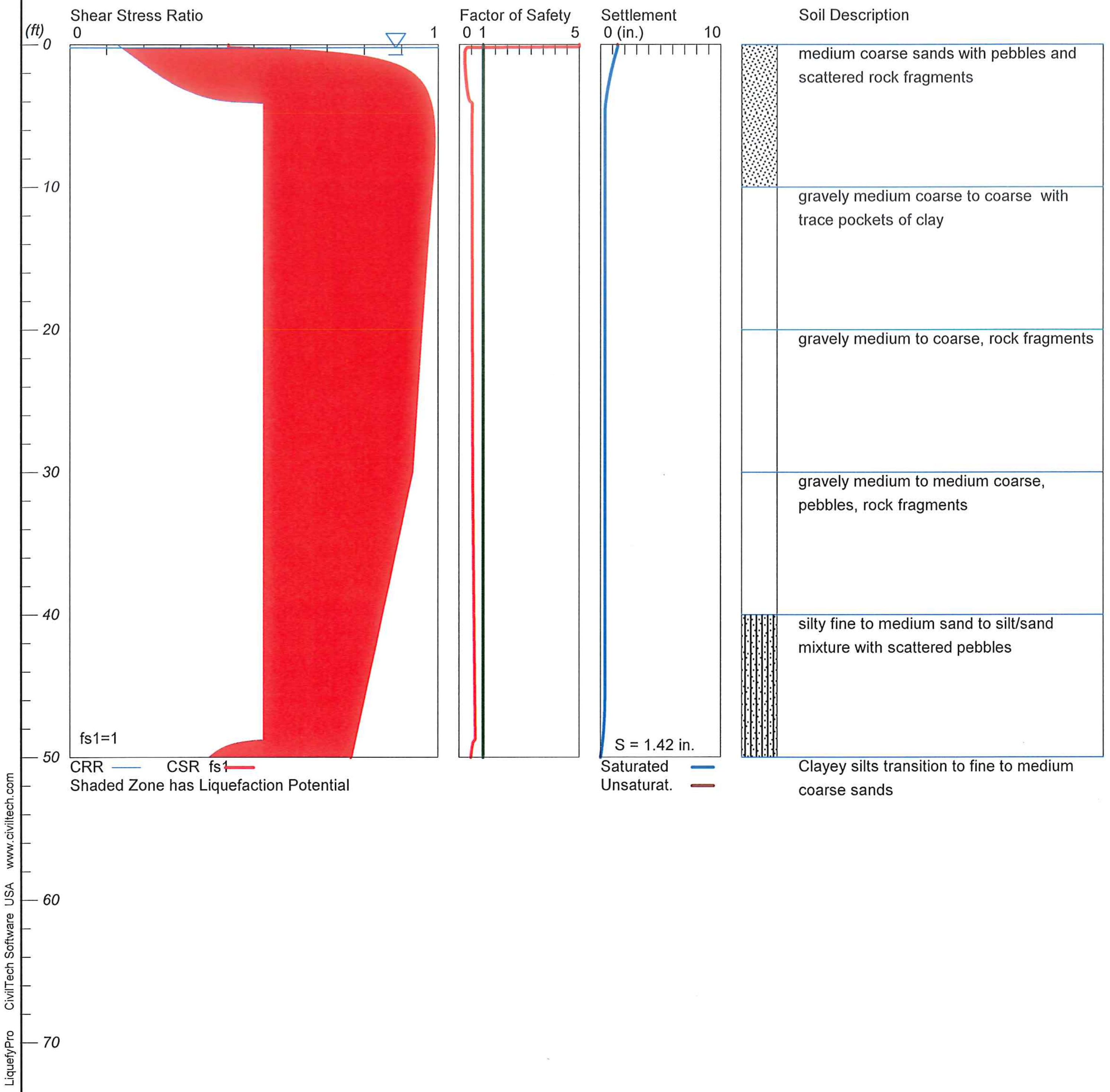
Liquefaction/Settlement Analysis

LIQUEFACTION ANALYSIS

Tech Equipment/776 W. Mill St. SBD_Pre Constructio

Hole No.=B-1 Water Depth=0.2 ft Surface Elev.=1022.

Magnitude=7.35
Acceleration=0.663g



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LIQUEFACTION ANALYSIS SUMMARY

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Font: Courier New, Regular, Size 8 is recommended for this report.

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Input File Name: C:\Users\JohnFlippin\OneDrive - Soils Southwest, Inc\JohnsComputer Folders\JOHN SSW FILES\21001 TechEquipSBD.liq

Title: ***Tech Equipment/776 W. Mill St. SBD_Pre Construction***

Subtitle: 21001-F

Surface Elev.=1022.

Hole No.=B-1

Depth of Hole= 50.00 ft

Water Table during Earthquake= 0.20 ft

Water Table during In-Situ Testing= 0.20 ft

Max. Acceleration= 0.66 g

Earthquake Magnitude= 7.35

Input Data:

Surface Elev.=1022.

Hole No.=B-1

Depth of Hole=50.00 ft

Water Table during Earthquake= 0.20 ft

Water Table during In-Situ Testing= 0.20 ft

Max. Acceleration=0.66 g

Earthquake Magnitude=7.35

No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.

2. Settlement Analysis Method: Ishihara / Yoshimine

3. Fines Correction for Liquefaction: Stark/Olson et al.*

4. Fine Correction for Settlement: During Liquefaction*

5. Settlement Calculation in: All zones*

6. Hammer Energy Ratio, Ce = 1.00

7. Borehole Diameter, Cb= 1

8. Sampling Method, Cs= 1

9. User request factor of safety (apply to CSR) , User= 1.3

Plot one CSR curve (fs1=1)

10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.00	9.00	104.00	4.50
10.00	45.00	110.00	4.50
20.00	37.00	110.00	5.50
30.00	54.00	110.00	6.70
40.00	36.00	110.00	23.20
50.00	29.00	110.00	9.50

Output Results:

Settlement of Saturated Sands=1.42 in.

Settlement of Unsaturated Sands=0.00 in.

Total Settlement of Saturated and Unsaturated Sands=1.42 in.

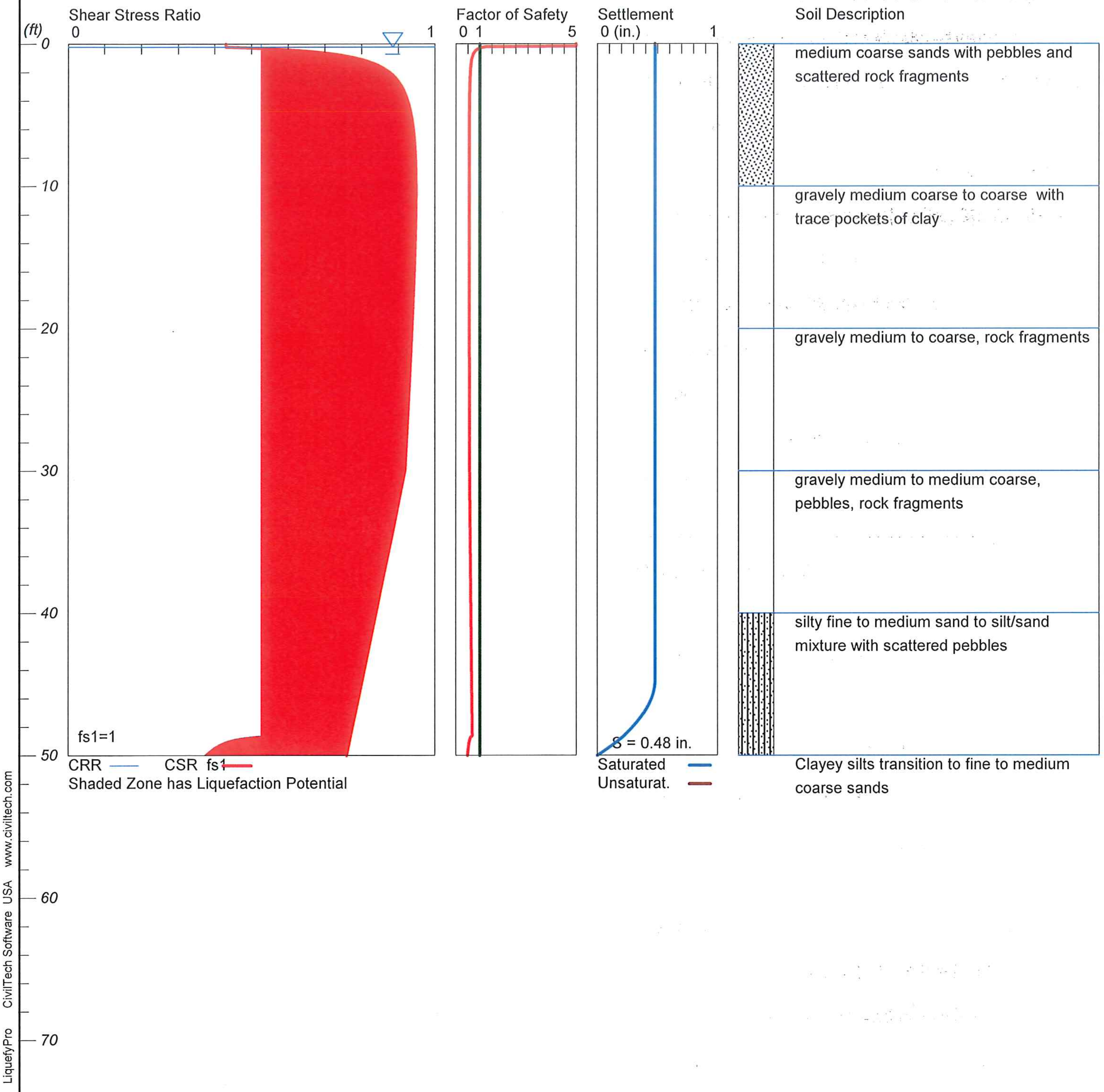
Differential Settlement=0.708 to 0.934 in.

LIQUEFACTION ANALYSIS

Tech Equipment/776 W. Mill St. SBD_PostConstructio

Hole No.=B-1 *Water Depth=0.2 ft* *Surface Elev.=1022.* *Magnitude=7.35*

Acceleration=0.663g



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LIQUEFACTION ANALYSIS SUMMARY
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Input File Name: C:\Users\JohnFlippin\OneDrive - Soils Southwest, Inc\JohnsComputer Folders\JOHN SSW FILES\21001 TechEquipSBD.liq

Title: ***Tech Equipment/776 W. Mill St. SBD_Post-Construction***

Subtitle: 21001-F

Surface Elev.=1022.

Hole No.=B-1

Depth of Hole= 50.00 ft

Water Table during Earthquake= 0.20 ft

Water Table during In-Situ Testing= 0.20 ft

Max. Acceleration= 0.66 g

Earthquake Magnitude= 7.35

Input Data:

Surface Elev.=1022.

Hole No.=B-1

Depth of Hole=50.00 ft

Water Table during Earthquake= 0.20 ft

Water Table during In-Situ Testing= 0.20 ft

Max. Acceleration=0.66 g

Earthquake Magnitude=7.35

No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.

2. Settlement Analysis Method: Ishihara / Yoshimine

3. Fines Correction for Liquefaction: Stark/Olson et al.*

4. Fine Correction for Settlement: Post Liquefaction

5. Settlement Calculation in: All zones*

6. Hammer Energy Ratio, Ce = 1.00

7. Borehole Diameter, Cb= 1

8. Sampling Method, Cs= 1

9. User request factor of safety (apply to CSR) , User= 1.3

Plot one CSR curve (fs1=1)

10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.00	30.00	110.00	4.50
10.00	45.00	110.00	4.50
20.00	37.00	110.00	5.50
30.00	54.00	110.00	6.70
40.00	36.00	110.00	23.20
50.00	29.00	110.00	9.50

Output Results:

Settlement of Saturated Sands=0.48 in.

Settlement of Unsaturated Sands=0.00 in.

Total Settlement of Saturated and Unsaturated Sands=0.48 in.

Differential Settlement=0.239 to 0.316 in.

PROFESSIONAL LIMITATIONS

Our investigation was performed using the degree of care and skill ordinarily exercised, under similar circumstances by other reputable Soils Engineers practicing in these general or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

The investigations are based on soil samples only, consequently the recommendations provided shall be considered 'preliminary'. The samples taken and used for testing and the observations made are believed representative of site conditions; however, soil and geologic conditions can vary significantly between test excavations. If this occurs, the changed conditions must be evaluated by the Project Soils Engineer and designs adjusted as required or alternate design recommended.

The report is issued with the understanding that it is the responsibility of the owner, or of his representative, to ensure that the information and recommendations contained herein are brought to the attention of the project architect and engineers. Appropriate recommendations should be incorporated into structural plans. The necessary steps should be taken to see that out such recommendations in field.

The findings of this report are valid as of this present date. However, changes in the conditions of a property can occur with the passage of time, whether they due to natural process or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur from legislation or broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by change outside of our control. Therefore, this report is subject to review and should be updated after a period of one year.

RECOMMENDED SERVICES

The review of grading plans and specifications, field observations and testing by a geotechnical representative of this office is integral part of the conclusions and recommendations made in this report. If Soils Southwest, Inc. (SSW) is not retained for these services, the Client agrees to assume SSI's responsibility for any potential claims that may arise during and after construction, or during the life-time use of the structure and its appurtenant.

The recommendations supplied should be considered valid and applicable, provided the following conditions, in minimum, are met:

i. Pre-grade meeting with contractor, public agency and soils engineer,
ii. Excavated bottom inspections and verification s by soils engineer prior to backfill placement,
iii. Continuous observations and testing during site preparation and structural fill soils placement,
iv. Observation and inspection of footing trenching prior to steel and concrete placement,
v. Subgrade verifications including plumbing trench backfills prior to concrete slab-on-grade placement,
vi On and off-site utility trench backfill testing and verifications,
vii Precise-grading plan review, and
viii. Consultations as required during construction, or upon your request.

Soils Southwest, Inc. will assume no responsibility for any structural distresses during its life-time use; in event the above conditions are not strictly fulfilled.

Appendix E
Hydrology & Drainage Study

Preliminary Hydrology Study & Drainage Analysis

776 Mill St.
San Bernardino, CA 92410
136-151-06, -09, -11, 19 & 0136-142-02

Prepared For:

TEC Equipment
750 NE Columbia Blvd
Portland, OR 97211
Phone: (503) 515-9140

Prepared By:

Joseph E. Bonadiman & Associates, Inc.
234 North Arrowhead Avenue
San Bernardino, CA 92408
Telephone: (909) 885-3806
Fax: (909) 381-1721

www.bonadiman.com

March 2021

REGISTERED PROFESSIONAL ENGINEER
JAMES T. STANTON
No. C-70944
Exp. 6-30-21
CIVIL
STATE OF CALIFORNIA

Table of Contents

Exhibits

Exhibit	No.
Project Watershed – Aerial Photo	A
Project Watershed – USGS Quadrangle	B
FEMA FIRM	C
San Bernardino County Hydrology Manual Isohyetal Map	D
San Bernardino County Hydrology Manual Soils Map	E
Existing Conditions Study Map	F
Developed Conditions Study Map	G

Attachments

Attachments	No.
Existing Conditions 25-Year, 1-Hour & 100-Year, 1-Hour Rational Method Calculations	1
2-Year, 1-Hour	
5-Year, 1-Hour	
Existing Conditions Unit Hydrograph Calculations	2
2-Year, 1-Hour	
5-Year, 1-Hour	
10-Year, 1-Hour	
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10-Year, 1-Hour	
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10-Year, 24-Hour (Area “C” only)	
25-Year, 24-Hour	
100-Year, 24-Hour	
Hydraulics	5
6’ Parkway Culvert Capacity	
24in Highway Grate Inlet Capacity	

A. Introduction

1.1 Purpose & Scope

The following Preliminary Hydrology & Hydraulics Report has been prepared for the development of the TEC Equipment project located at 776 Mill Street in the City of San Bernardino, CA. This report has been prepared to satisfy the City of San Bernardino and San Bernardino County Department of Public Works hydrology study requirements for developments of this type.

The scope of this report is as follows:

- Identification of tributary flow impacting the project site.
- Identification of existing conditions on-site drainage areas and calculation of peak flow for these areas.
- Identification of developed conditions on-site drainage areas and calculation of peak flow for these areas.
- Comparison of existing vs. developed peak flow rates and discussion of mitigation measures used to attenuate increases (if any) in peak flows.
- Identification of floodplain(s) impacting the site.
- Summary of finding and conclusion.

1.2 Project Overview

The project is located north of Mill Street, immediately to the east of northbound I-215 on-ramp and southwest of the Lytle Creek Channel. The proposed project entails the development of multiple vacant parcels for a truck and trailer sales lots. The site totals approximately 7.08 acres. A small portion of the site is between an existing industrial complex and the fence line of the east branch of the Lytle Creek Channel and is not a part of this study. The total study watershed area is therefore 7.01 acres.

Site Location

1.3 Tributary Drainage Areas

Per field investigation and examination of existing aerial topography, the project site is not impacted by any tributary (offsite) drainage areas, due to the existing flood control channel to the east and the freeway to the west.

1.4 Existing Conditions On-Site Areas

The project site is located in the "Central City South" (CCS-1) zone of San Bernardino. The subject property is north of Mill Street and immediately to the east of northbound I-215 on-ramp, south west of the Lytle Creek Channel. To the south of the project site is an industrial complex and a commercial building.

The project site consists of fair cover, natural weeds and grass, in a low-lying area with no significant off-site tributary. Drainage generally flows to the southeast where current flow are directed to the existing industrial complex and conveyed around the perimeter of the complex via existing gutters.

Southern portion of site looking northwest.

Southern portion of site looking north.

Northern portion of site looking south.

1.5 References

The following documents have been made part of this study by reference:

1.) San Bernardino County Department of Public Works Hydrology Manual (August 1986).

2.) Preliminary Grading Plans prepared by Joseph E. Bonadiman & Associates, Inc. (March 2021).

B. Methodology

1.1 General Methodology

The requirements and recommendations found in the San Bernardino County Hydrology Manual (August 1986) provided by the San Bernardino County Department of Public Works was used as the basis for the methodology and calculations found in this report. On-site calculations were performed using the rational hydrology method to determine peak flow rates.

The San Bernardino County-approved software applications provided by CivilDesign® Corporation were used for all study calculations.

1.2 Sources of Topography

For the existing conditions on-site areas mapping and topographic contours based on an aerial survey performed and mapped by Digital Mapping, Inc. dated January 13, 2021. For the developed conditions on-site areas, proposed grades per the Grading Plan prepared by Joseph E. Bonadiman & Associates, Inc. (March 2021) were used.

1.3 FEMA Floodplain Identification & Considerations

Per FEMA FIRM Panel No. 06071C8681J, & 06071C8683J (Effective Date – September 2, 2016), the project site is located within shaded Zone X ("Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 1% annual chance flood").

Refer to Exhibit "C" for the FIRM used in this report.

1.4 Watershed Precipitation

Precipitation values used in this report were obtained from the Isohyetal Map(s) included in the San Bernardino County Hydrology Manual and are tabulated below. The slope of intensity duration curve value of 0.60 (valley areas) was used per the County Hydrology Manual.

Table 1 – Watershed Precipitation

STORM	PRECIPITATION
10-YEAR, 1-HOUR	0.83
100-YEAR, 1-HOUR	1.28

Table 2 – Precipitation Values (Unit Hydrograph Calculations)

STORM	PRECIPITATION
10-YEAR, 1-HOUR	0.83
100-YEAR, 1-HOUR	1.28
2-YEAR, 6-HOUR	1.41
100-YEAR, 6-HOUR	2.60
2-YEAR, 24-HOUR	2.40
100-YEAR, 24-HOUR	5.90

Refer to Exhibit "D" for the San Bernardino County Hydrology Manual isohyetal maps used in this report.

1.5 Watershed Losses

Soil types and SCS Curve Number (AMC III) used in this report were obtained from the Soils Group map and Figures C-2 to C-7, included in the San Bernardino County Hydrology Manual and are tabulated below.

The site is composed of Type "A" soil. The existing conditions study site is currently developed with commercial landscaping pervious cover. The developed conditions site will also utilize commercial landscaping. Therefore, per San Bernardino County Hydrology Manual Figure C-6, the SCS Curve Numbers (AMC II) used for existing conditions is 50 ("Annual Grass/Fair Condition") and developed conditions is 32 ("Landscape/Good Condition") for pervious areas and 98 ("Impervious") for the parking lots, roofs, driveways, etc.

Table 3 – Watershed Losses

COVER TYPE	SOIL TYPE	QUALITY OF COVER	SCS CURVE NO. (AMC II)
ANNUAL GRASS	A	FAIR	50
COMMERCIAL LANDSCAPE	A	~	32

Refer to Exhibit "E" for the San Bernardino County Hydrology Manual soils map and SCS Curve Number per Figure C-6 used in this report.

1.6 Rational Hydrology Method Calculations

The San Bernardino County Rational Method (CIVILD) software application provided by CivilDesign® Corporation was used for the rational method calculations included in this report.

C. Existing Conditions Hydrology Calculations

1.1. Existing Conditions Rational Method Calculations

Input values for the existing conditions rational method calculations prepared for this report are tabulated below:

Table 4 – Existing Conditions Rational Method Input Values

AREA	SIZE (AC)	COVER TYPE	SOIL	U.S. ELEV. (FT)	D.S. ELEV. (FT)	LENGTH (FT)
A1 Node 0-1	7.01	ANNUAL GRASS	A	1028.0	1017.8	971

Output for the existing conditions rational method calculations are tabulated as follows:

Table 5 – Existing Conditions Rational Method Output Calculations

AREA	NODE	Q_{25} (CFS)	Q_{100} (CFS)	TC_{100} (MIN)
A	0-1	5.06	9.54	27.51

Refer to Attachment No. 1 for printouts of the Existing Conditions Rational Method Calculations.
Refer to Exhibit "F" for the Existing Conditions Hydrology Study Map.

1.2. Existing Conditions Unit Hydrograph Method Calculations

Based on the output data from the Rational Method above the 100-year TC value was used. Input values for the developed conditions unit hydrograph method calculations prepared for this report are tabulated as follows:

Table 6 – Existing Conditions Unit Hydrograph Method Input Values

DRAINAGE AREA	SIZE (AC)	SCS	PERVIOUS FRACTION	TC_{100} (HR)
A	7.01	50	1.00	0.46

Output for the existing conditions unit hydrograph method calculations are tabulated as follows:

Table 7 – Existing Conditions Unit Hydrograph Method Output Calculations

DRAINAGE AREA	SIZE (AC)	Q_2 (CFS)	Q_5 (CFS)	Q_{10} (CFS	Q_{25} (CFS)	Q_{100} (CFS)	LAG_{100} (HR)
A	7.01	1.43	2.31	3.71	**5.11**	**8.96**	0.37

DRAINAGE AREA	SIZE (AC)	VOL_2 (AF)	VOL_5 (AF)	VOL_{10} (AF)	VOL_{25} (AF)	Q_{100} (AF)	LAG_{100} (HR)
A	7.01	0.06	0.10	0.31	**0.51**	**1.75**	0.37

Refer to Attachment No. 2 for printouts of the existing conditions unit hydrograph calculations.
Refer to Exhibit "F" for the Existing Conditions Hydrology Study Map.

D. Developed Conditions Hydrology Calculations

1.1 Developed Conditions Rational Method Calculations

Input values for the developed conditions rational method calculations were adjusted accordingly and are tabulated below:

Table 8 – Developed Conditions Rational Method Input Values

AREA	SIZE (AC) OR (IN)	PERVIOUS RATIO	SCS	U.S. ELEV. (FT)	D.S. ELEV. (FT)	LENGTH (FT)
A-1 NODE 0-1	0.59	0.15	32	1023.10	1019.63	233
PIPE NODE 1-2	18	~	~	1015.63	1014.65	326.5
A-2 NODE 2	0.97	0.10	32	~	~	~
PIPE NODE 2-3	18	~	~	1014.65	1013.96	230.7
A-3 NODE 3	1.75	0.14	32	~	~	~
PIPE NODE 3-4	18	~	~	1013.96	1013.50	137.3
CONFLUENCE MINOR STREAM 1 OF 2 AT NODE 4						
A-4 NODE 5-6	2.50	0.09	32	1025.33	1020.09	468.2
PIPE NODE 6-4	18	~	~	1016.09	1013.50	254.2
CONFLUENCE MINOR STREAM 2 OF 2 AT NODE 4						
OPEN CHANNNEL NODE 1-8	1.20	0.82	~	1019.63	1019.43	242

Output for the developed conditions rational method calculations are tabulated as follows:

Table 9 – Developed Conditions Rational Method Output Calculations

AREA	NODE	Q_{25} (CFS)	Q_{100} (CFS)	TC_{100} (MIN)
A	0-8	15.74	20.82	10.87

Refer to Attachment No. 3 for printouts of the Developed Conditions Rational Method Calculations. Refer to Exhibit "G" for the Developed Conditions Hydrology Study Map.

1.2 Developed Conditions Unit Hydrograph Method Calculations

Based on the output data from the Rational Method above the 100-year TC value was used. Input values for the existing conditions unit hydrograph method calculations prepared for this report are tabulated as follows:

Table 10 – Developed Conditions Unit Hydrograph Method Input Values

DRAINAGE AREA	SIZE (AC)	SCS	PERVIOUS FRACTION	TC_{100} (HR
A	7.01	32	0.23	0.18

Output for the developed conditions unit hydrograph method calculations are tabulated as follows:

Table 11 Developed Conditions Unit Hydrograph Method Output Calculations

DRAINAGE AREA	SIZE (AC)	Q_2 (CFS)	Q_{10} (CFS	Q_{25} (CFS)	Q_{100} (CFS)	LAG_{100} (HR)
A	7.01	7.36	12.47	15.39	20.22	0.14

DRAINAGE AREA	SIZE (AC)	VOL_2 (AF)	VOL_{10} (AF)	VOL_{25} (AF)	VOL_{100} (AF)	LAG_{100} (HR)
A	7.01	1.00	1.67	2.05	2.78	0.14

Refer to Attachment No. 4 for printouts of the existing conditions unit hydrograph calculations.
Refer to Exhibit "G" for the Developed Conditions Hydrology Study Map.

E. Summary & Conclusion

1.1 Summary

A summary of the results of the rational hydrology calculations is tabulated below:

Table 12 –Rational Method Calculations Summary

STORM EVENT	EXISTING CONDITIONS PEAK Q (CFS)	FINAL CONDITIONS PEAK Q (CFS)	INCREASE (CFS)
25	5.06	15.74	10.68
100	9.54	20.82	**11.28**

*** Above listed values are results prior to basin routing & WQMP storage and not reflective of actual site discharge.**

A summary of the results of the unit hydrograph calculations for Area "A" are tabulated below:

Table 13 –Unit Hydrograph Calculations Summary

AREA	STORM EVENT	EXISTING CONDITIONS PEAK Q (CFS)	DEVELOPED CONDITIONS PEAK Q (CFS)	INCREASE (CFS)*	EXISTING CONDITIONS VOLUME (AF)	DEVELOPED CONDITIONS VOLUME (AF)	INCREASE (AF)*
A	2	1.43	7.36	**5.93**	0.06	1.00	**0.94**
	10	3.71	12.47	**8.76**	0.31	1.67	**1.36**
	25	5.11	15.39	**10.28**	0.51	2.05	**1.54**
	100	8.96	20.22	**11.26**	1.75	2.78	**1.03**

*** Above listed values are results prior to basin routing & WQMP storage and not reflective of actual site discharge.**

As indicated above, Area "A" results in an increase in peak flow and runoff volume, due to the proposed development. The increase in flow rates for Area "A" shall be mitigated onsite as to reduce the total site discharge to 90% of the pre-development conditions per the San Bernardino County Hydrology Manual.

Per "San Bernardino County Detention Basin Design Criteria" post-development peak flow rates generated by the site shall be less than or equal to 90% of the pre-development peak flow rate based on shifting the rainfall values for the 10-year, 25-year and 100-years storms, providing a least a 50% confidence level that the detention basin outflow will not adversely impact downstream properties. A summary of the maximum allowable peak flow rates are tabulated below:

Table 14 – Area "C" Outlet Requirements

EXISTING AREA	STORM EVENT	EXISTING CONDITIONS PEAK Q (CFS)	ADJUSTED PEAK Q (CFS)	MAXIMUM ALLOWABLE DISCHARGE 90% OF ADJUSTED PEAK Q (CFS)
A	2	1.43	Q_2=1.43	**1.29**
	10	3.71	Q_5=2.31	**2.08**
	25	5.11	Q_{10}=3.71	**3.34**
	100	8.96	Q_{25}=5.11	**4.60**

Due to the fact that site is in a low area, connection to the storm channel is not allows without special permitting with the USACE and the fact that there is not sufficient elevation to accommodate an onsite detention basin the only option to mitigate storm water flow is an underground infiltration retention/detention system. This system will need to be capable of capturing storm flows from the 100-year event and provide enough capacity in order to reduce the total site discharge to 90% of the predeveloped condition.

Table 15 – Unit Hydrograph Outlet Summary

AREA	STORM EVENT	EXISTING PEAK Q (CFS)	DEVELOPED PEAK Q (CFS)	EXISTING VOLUME (AF)	DEVELOPED VOLUME (AF)	STORM CHAMBER VOLUME (AF)	DISCHARGE VOLUME (AF)	STORM CAPTURE (%)
A	2	1.43	0	0.06	1.00	2.07	0	**100**
	10	3.71	0	0.31	1.67		0	**100**
	25	5.11	0	0.51	2.05		0	**100**
	100	8.96	3.71	1.75	2.78		0.71	**74**

Mitigation of developed peak flow rates can be achieved by capturing the storm volume to a point where the hydrograph outflow rates are less than the above maximum allowable peak Q's. Based on the hydrograph output files in Attachment 4 an underground storm infiltration chamber with the capacity of 2.07 acer-feet (90,169 CF) resulting in a peak discharge of 3.71 CFS from the 100-year, 24-hour storm will be needed to reduce developed peak flow rate to the maximum allowable peak flows in Table 14. Due to site limitations, retention/detention infiltration of the 100-year, 24-hour (1 day storm) is proposed. Therefor routing calculations are not required; refer to Attachment No. 4 for printouts of the developed conditions unit hydrograph calculations.

1.2 Conclusion

As indicated in Table 16, an increase in peak flow and runoff volume is expected for Area “A”, due to the proposed development. The increase in flow rates for Area “A” shall be mitigated onsite as to reduce the total site discharge to 90% of the pre-development conditions per the San Bernardino County Hydrology Manual.

Per the San Bernardino County Hydrology Manual, developed sites shall not increase existing condition flow rate. In order to meet mitigation requirements per “San Bernardino County Detention Basin Design Criteria” post-development peak flow rates generated by the site shall be less than or equal to 90% of the pre-development peak flow rate based on shifting the rainfall values for the 10-year, 25-year and 100-years storms, providing a least a 50% confidence level that the detention basin outflow will not adversely impact downstream properties. This can be achieved with the use of an underground storm infiltration chamber with the capacity of 2.07 acer-feet (90,169 CF). Onsite drainage for Area “A” shall be captured onsite and directed to the underground storm infiltration chamber prior to leaving the site. The above stated volume will provide 100% capture of the 2, 5, 10, and 25-year 24-hour storm events and reduce discharge from the 100-year, 24-hour storm event storm to less than 4.60 CFS.

Overflow from Area “A” shall be conveyed to Mill Street via 6-foot wide 6-foot parkway culvert per City Standard 400, refer to Attachment No 5. Conveyance of site drainage over the Driveway approaches is not permitted.

With the above mitigation measure the development of the TEC Equipment project, 776 Mill Street, will not have a negative impact on downstream properties or facilities. Refer to project specific WQMP for additional requirements.

(END)

EXHIBIT “A”

Aerial Photo

AERIAL PHOTO EXHIBIT

TEC EQUIPMENT

IN THE CITY & COUNTY OF SAN BERNARDINO, CA

PREPARED BY:

BONADIAN
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234 NORTH ARROWHEAD AVE.
SAN BERNARDINO, CA 92408
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CIVILDESIGN®
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BY	MARK	REVISION DESCRIPTION	DATE

PREPARED FOR:	TEC EQUIPMENT
JOB NO:	204828
PREPARED BY:	JTS
CHECKED BY:	JTS

NOTE: JOSEPH E. BONADIMAN & ASSOCIATES, INC. DOES NOT WARRANTY THE ACCURACY OF THE G.I.S. DATA PRESENTED IN THIS EXHIBIT. THIS EXHIBIT MAY CONTAIN INFORMATION COPYRIGHTED TO SAN BERNARDINO COUNTY, CA.

AERIAL PHOTO EXHIBIT
TEC EQUIPMENT
IN THE CITY & COUNTY OF SAN BERNARDINO, CA

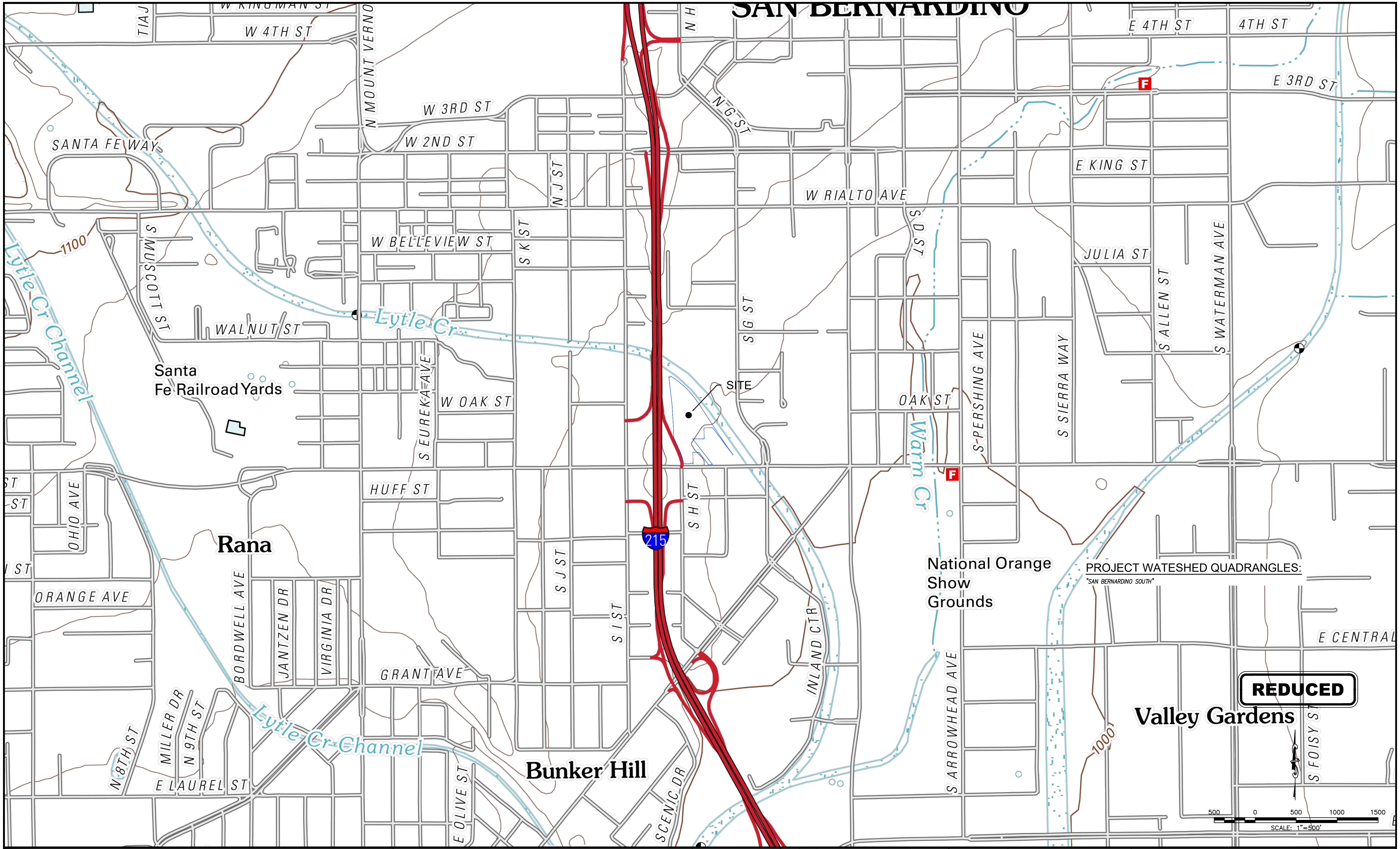
A

DISREGARD PRINTS BEARING EARLIER REVISION DATES ➡ 03–16–21

SHEET 1 OF 1

EXHIBIT “B”

Project Watershed
USGS Quadrangle



USGS QUADRANGLE EXHIBIT

TEC EQUIPMENT

IN THE CITY & COUNTY OF SAN BERNARDINO, CA

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USGS QUADRANGLE EXHIBIT
TEC EQUIPMENT
IN THE CITY & COUNTY OF SAN BERNARDINO, CA

B

DISREGARD PRINTS BEARING EARLIER REVISION DATES ➡ 03–22–21

SHEET 1 OF 1

EXHIBIT “C”

FEMA FIRM

NOTES TO USERS

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Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11 North. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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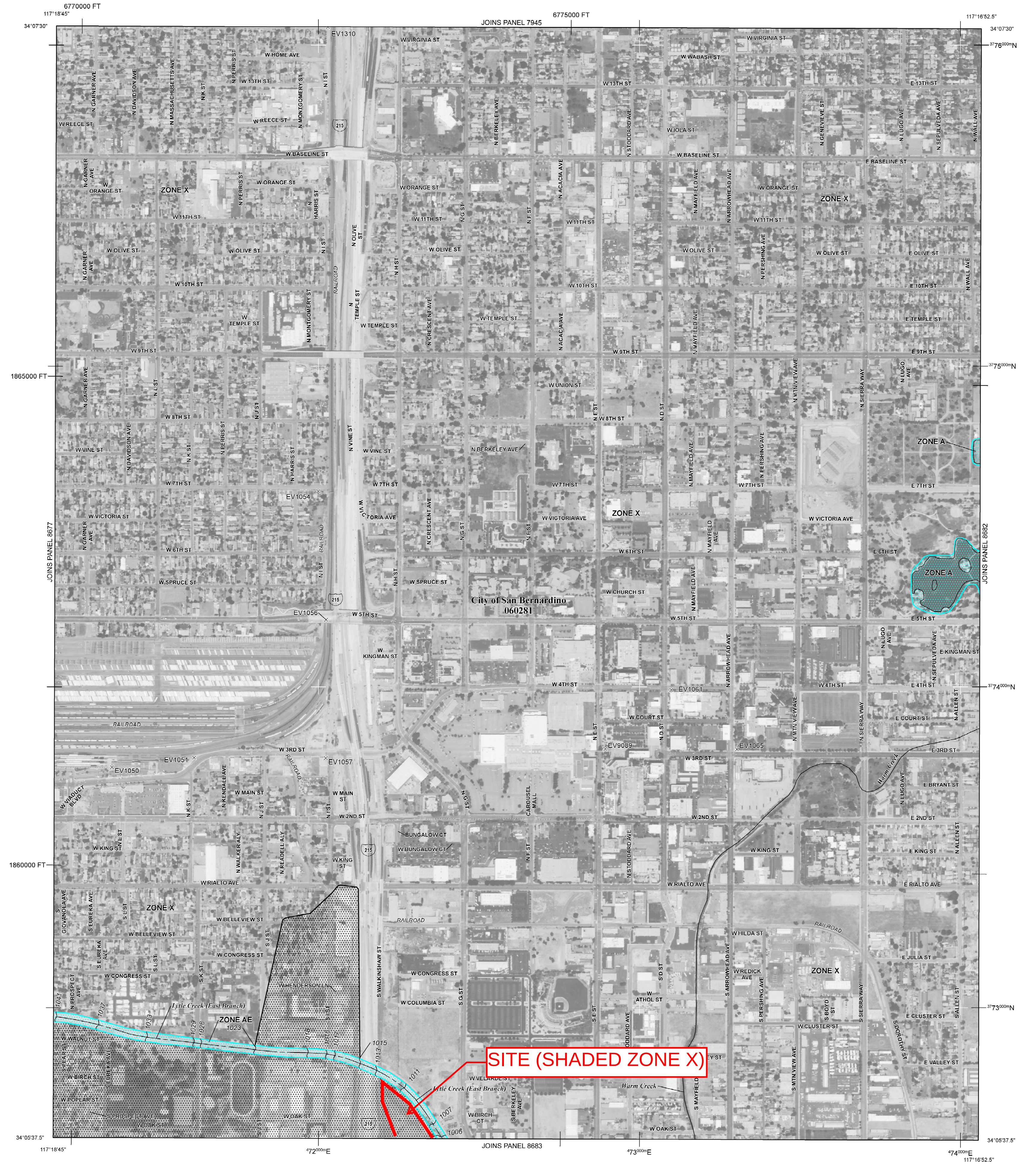

LEGEND

▨ SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

▨ FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

░ OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

☐ OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

▧ COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

▧ OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

━━━━	1% annual chance floodplain boundary
━━━━	0.2% annual chance floodplain boundary
── ── ──	Floodway boundary
── ── ──	Zone D boundary
••••••••	CBRS and OPA boundary
▨ ←	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
~~ 513 ~~~	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

⟨A⟩——⟨A⟩	Cross section line
(23)- - - -(23)	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
$^{42}75^{000m}$E	1000-meter Universal Transverse Mercator grid values, zone 11
6000000 FT	5000-foot grid ticks: California State Plane coordinate system, Zone V (FIPSZONE = 405), Lambert projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 2, 2016 – to change Base Flood Elevations, to add Base Flood Elevations, to change Special Flood Hazard Areas, to add Special Flood Hazard Areas, to change zone designations, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

N

MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 8681J

FIRM

FLOOD INSURANCE RATE MAP

SAN BERNARDINO COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 8681 OF 9400

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SAN BERNARDINO, CITY OF	060281	8681	J

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06071C8681J

MAP REVISED
SEPTEMBER 2, 2016

Federal Emergency Management Agency

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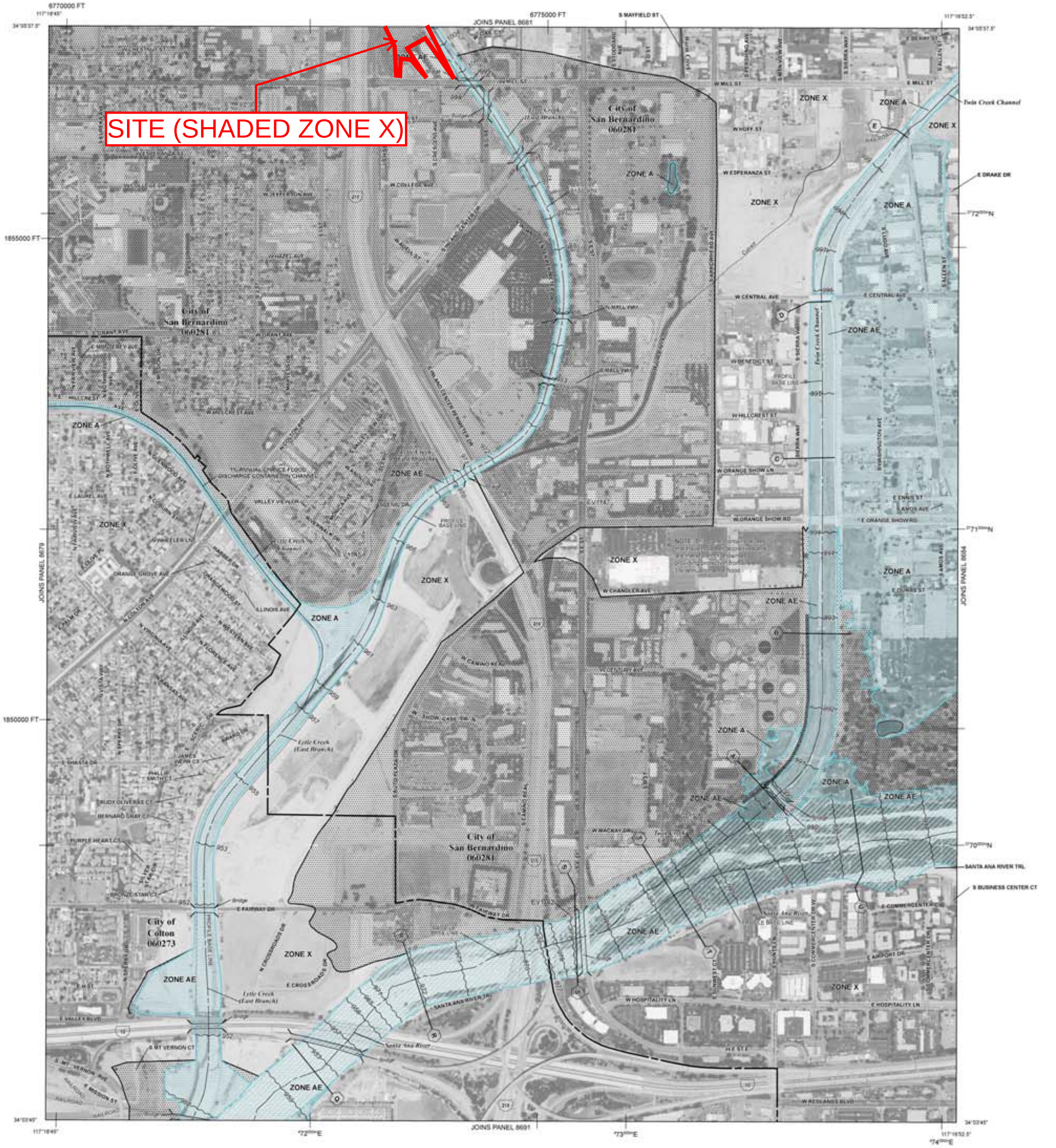

LEGEND

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▨ OTHER FLOOD AREAS

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☐ OTHER AREAS

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CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

———	1% annual chance floodplain boundary
———	0.2% annual chance floodplain boundary
— — —	Floodway boundary
— — —	Zone D boundary
••••••••••	CBRS and OPA boundary
▨ ←	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
~~ 513 ~~~	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

(A)———(A)	Cross section line
(23)- - - -(23)	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4275000mE	1000-meter Universal Transverse Mercator grid values, zone 11
6000000 FT	5000-foot grid ticks: California State Plane coordinate system, Zone V (FIPSZONE = 405), Lambert projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 2, 2016 – to change Base Flood Elevations, to add Base Flood Elevations, to change Special Flood Hazard Areas, to add Special Flood Hazard Areas, to change zone designations, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 8683J

FIRM
FLOOD INSURANCE RATE MAP
SAN BERNARDINO COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 8683 OF 9400

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLTON, CITY OF	060273	8683	J
SAN BERNARDINO, CITY OF	060281	8683	J

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

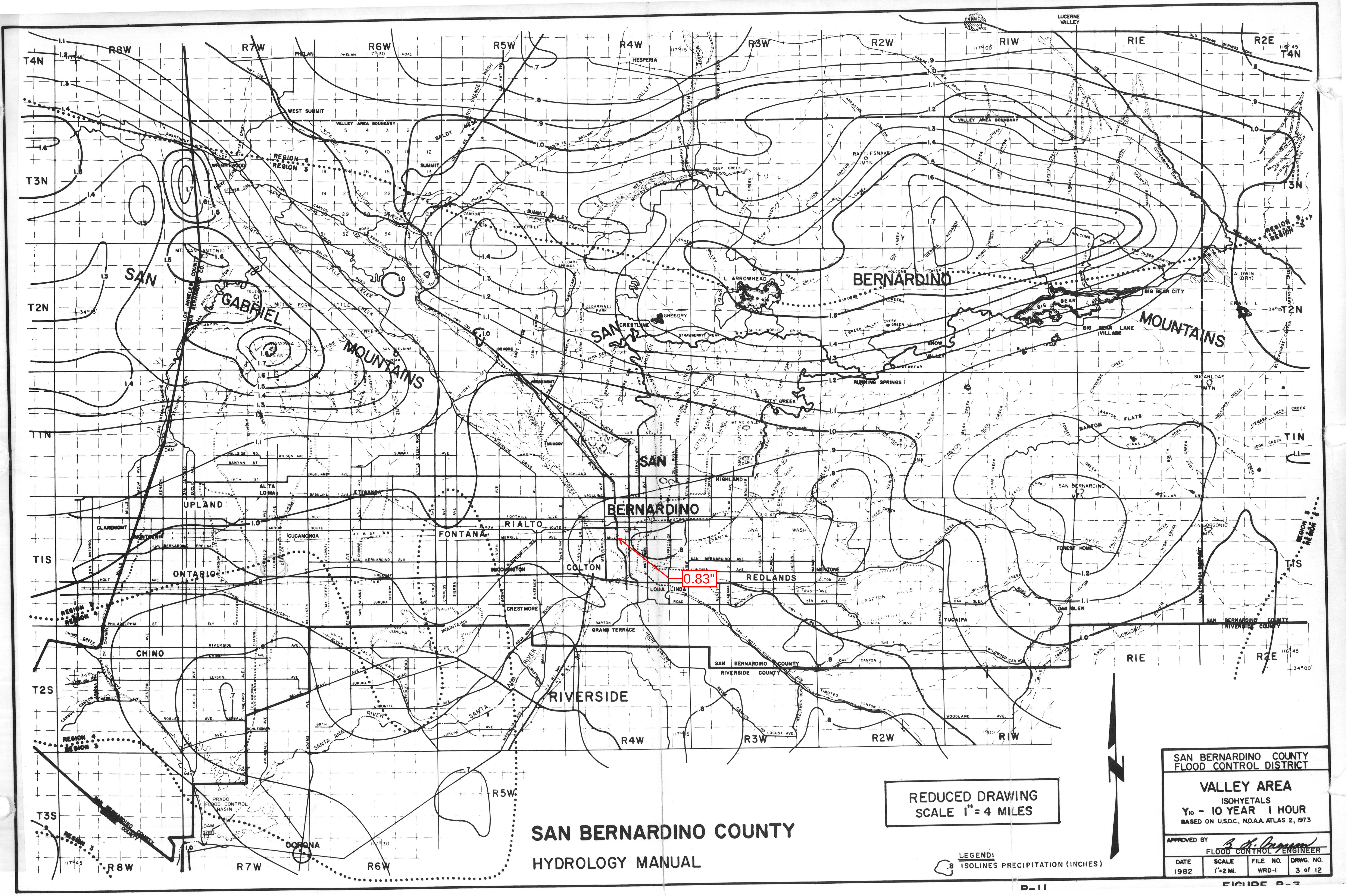
MAP NUMBER
06071C8683J

MAP REVISED
SEPTEMBER 2, 2016

Federal Emergency Management Agency

EXHIBIT “D”

San Bernardino County
Hydrology Manual
Isohyetal Maps



REDUCED DRAWING
SCALE 1" = 4 MILES

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

LEGEND:
.8 ISOLINES PRECIPITATION (INCHES)

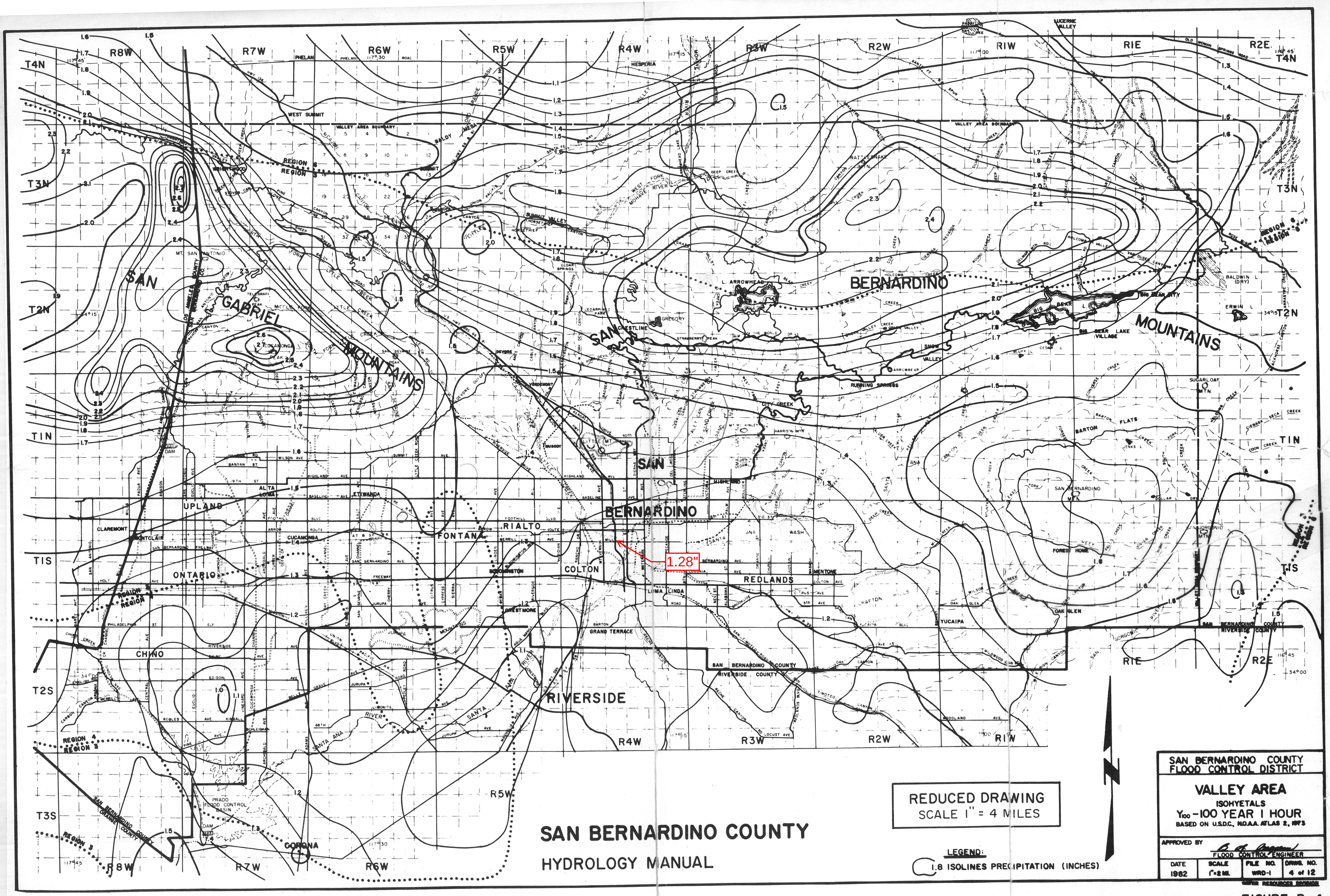
SAN BERNARDINO COUNTY
FLOOD CONTROL DISTRICT

VALLEY AREA
ISOHYETALS
Y_{10} - 10 YEAR 1 HOUR
BASED ON U.S.D.C., N.O.A.A. ATLAS 2, 1973

APPROVED BY B. L. Anderson
FLOOD CONTROL ENGINEER

DATE	SCALE	FILE NO.	DRWG. NO.
1982	1"=2 Mi.	WRD-1	3 of 12

FIGURE B-3



SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

REDUCED DRAWING
SCALE 1" = 4 MILES

LEGEND:
1.8 ISOLINES PRECIPITATION (INCHES)

SAN BERNARDINO COUNTY
FLOOD CONTROL DISTRICT

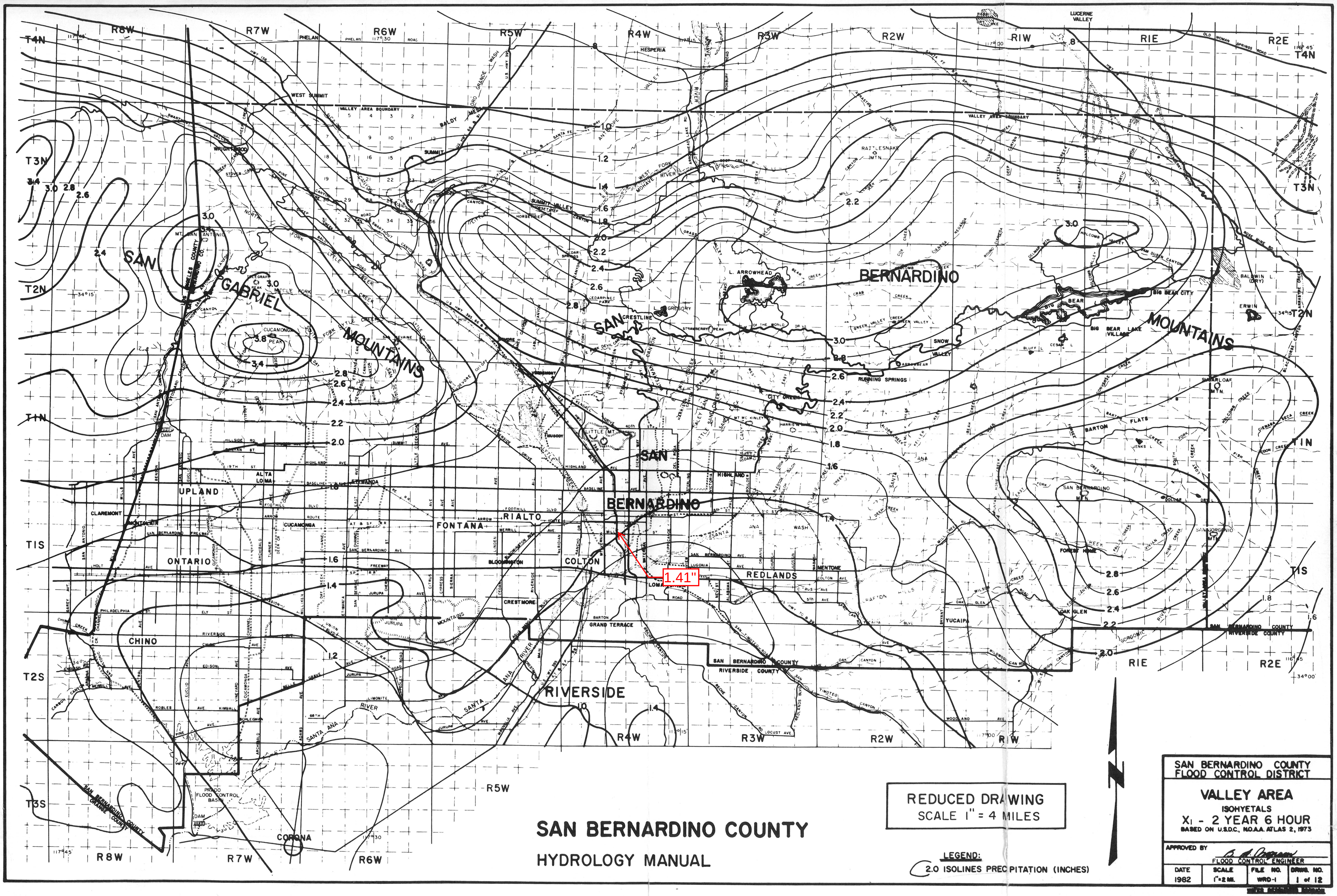
VALLEY AREA
ISOHYETALS
Y_{100} -100 YEAR 1 HOUR
BASED ON U.S.D.C., N.O.A.A. ATLAS 2, 1973

APPROVED BY
B. A. Bergman
FLOOD CONTROL ENGINEER

DATE	SCALE	FILE NO.	DRWG. NO.
1982	1"=2 MI.	WRD-1	4 of 12

WATER RESOURCES DIVISION

FIGURE B-4



SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

REDUCED DRAWING
SCALE 1" = 4 MILES

LEGEND:
2.0 ISOLINES PRECIPITATION (INCHES)

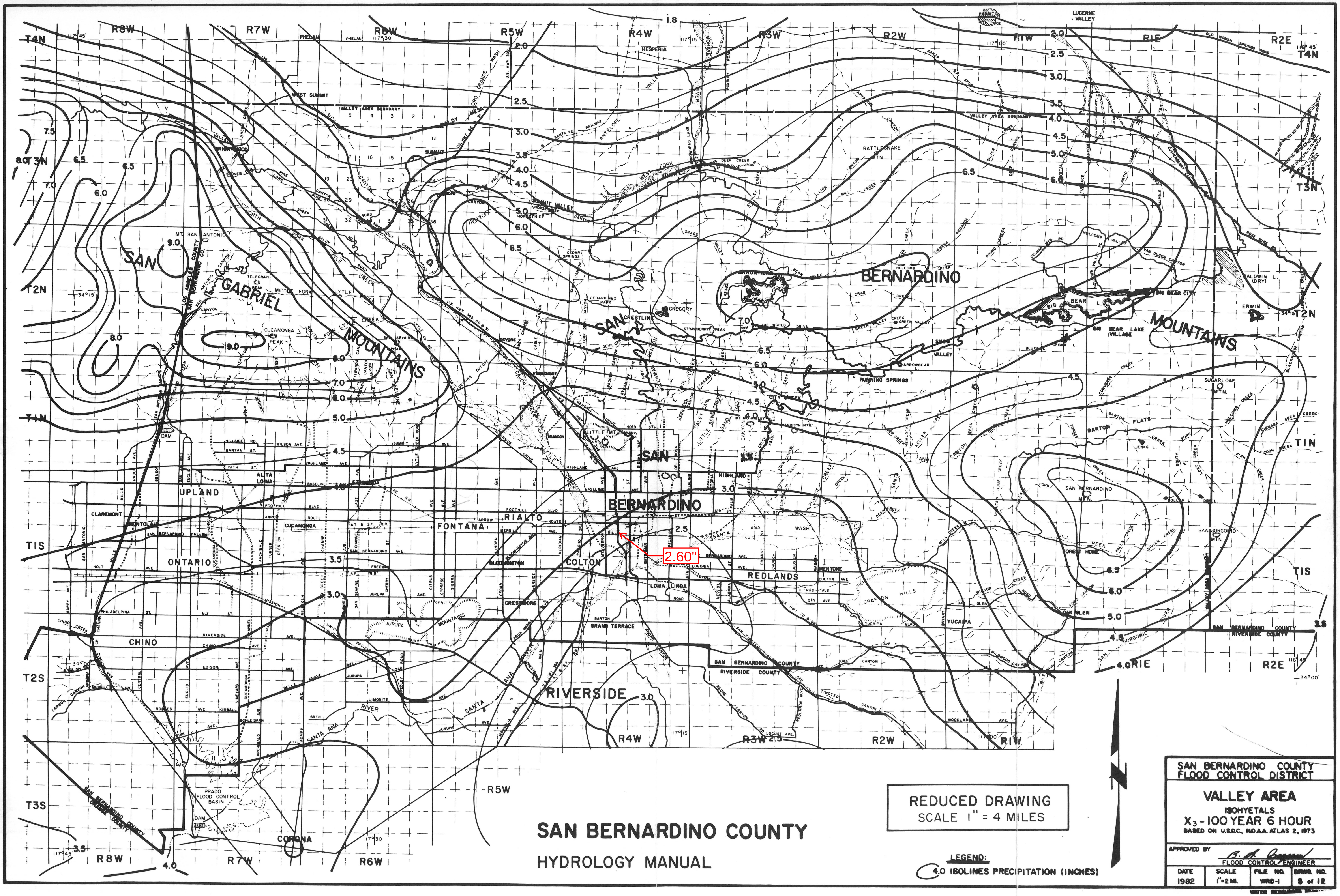
SAN BERNARDINO COUNTY
FLOOD CONTROL DISTRICT

VALLEY AREA
ISOHYETALS
X_1 - 2 YEAR 6 HOUR
BASED ON U.S.D.C., N.O.A.A. ATLAS 2, 1973

APPROVED BY
B. A. Bergman
FLOOD CONTROL ENGINEER

DATE	SCALE	FILE NO.	DRWG. NO.
1982	1" = 2 MI.	WRD-1	1 of 12

FIGURE B-1



SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

REDUCED DRAWING
SCALE 1" = 4 MILES

LEGEND:
4.0 ISOLINES PRECIPITATION (INCHES)

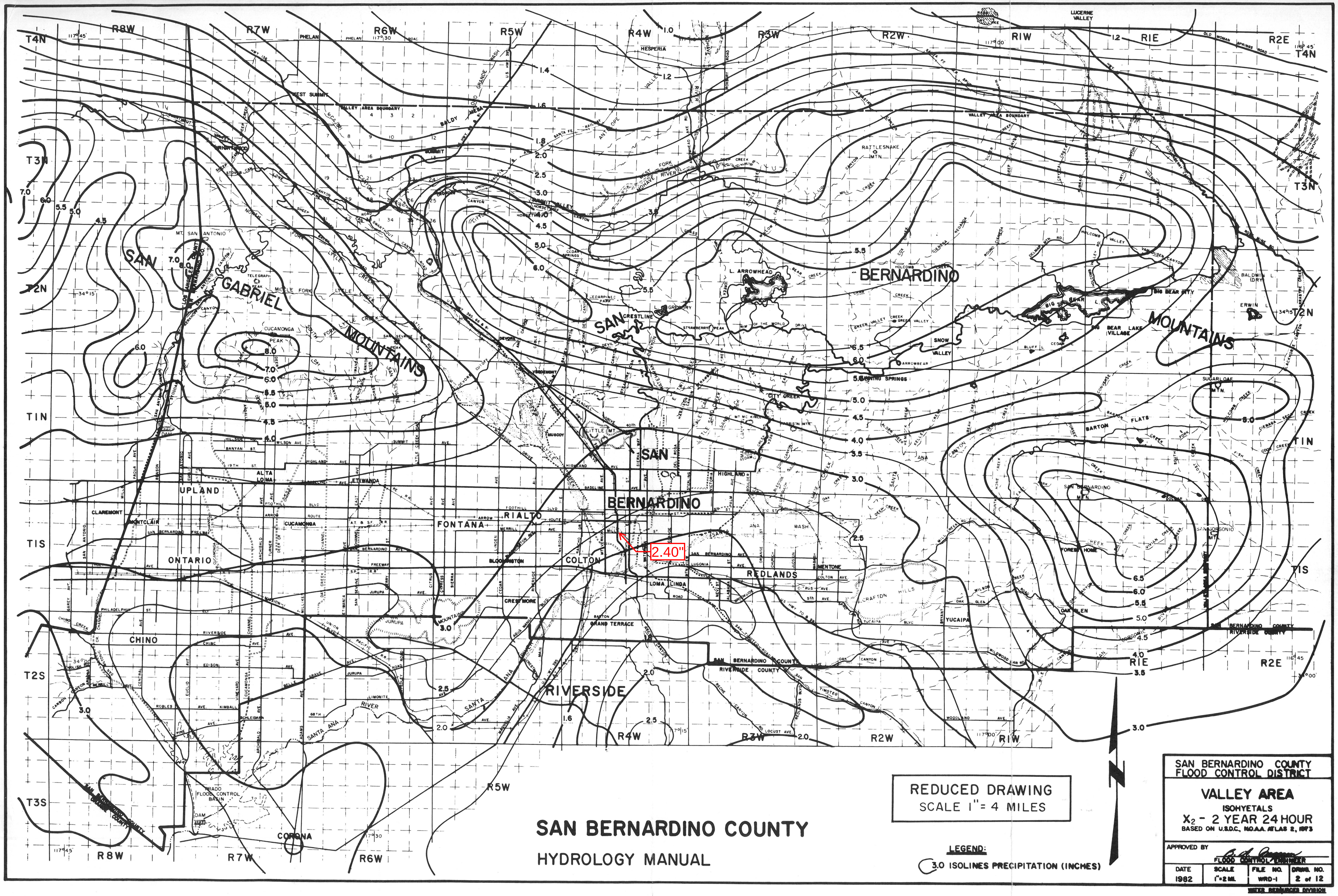
SAN BERNARDINO COUNTY
FLOOD CONTROL DISTRICT

VALLEY AREA
ISOHYETALS
X_3 - 100 YEAR 6 HOUR
BASED ON U.S.D.C., N.O.A.A. ATLAS 2, 1973

APPROVED BY
FLOOD CONTROL ENGINEER

DATE	SCALE	FILE NO.	DRWG. NO.
1982	1"=2 MI.	WRD-1	5 of 12

FIGURE B-5



SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

REDUCED DRAWING
SCALE 1" = 4 MILES

LEGEND:
3.0 ISOLINES PRECIPITATION (INCHES)

SAN BERNARDINO COUNTY
FLOOD CONTROL DISTRICT

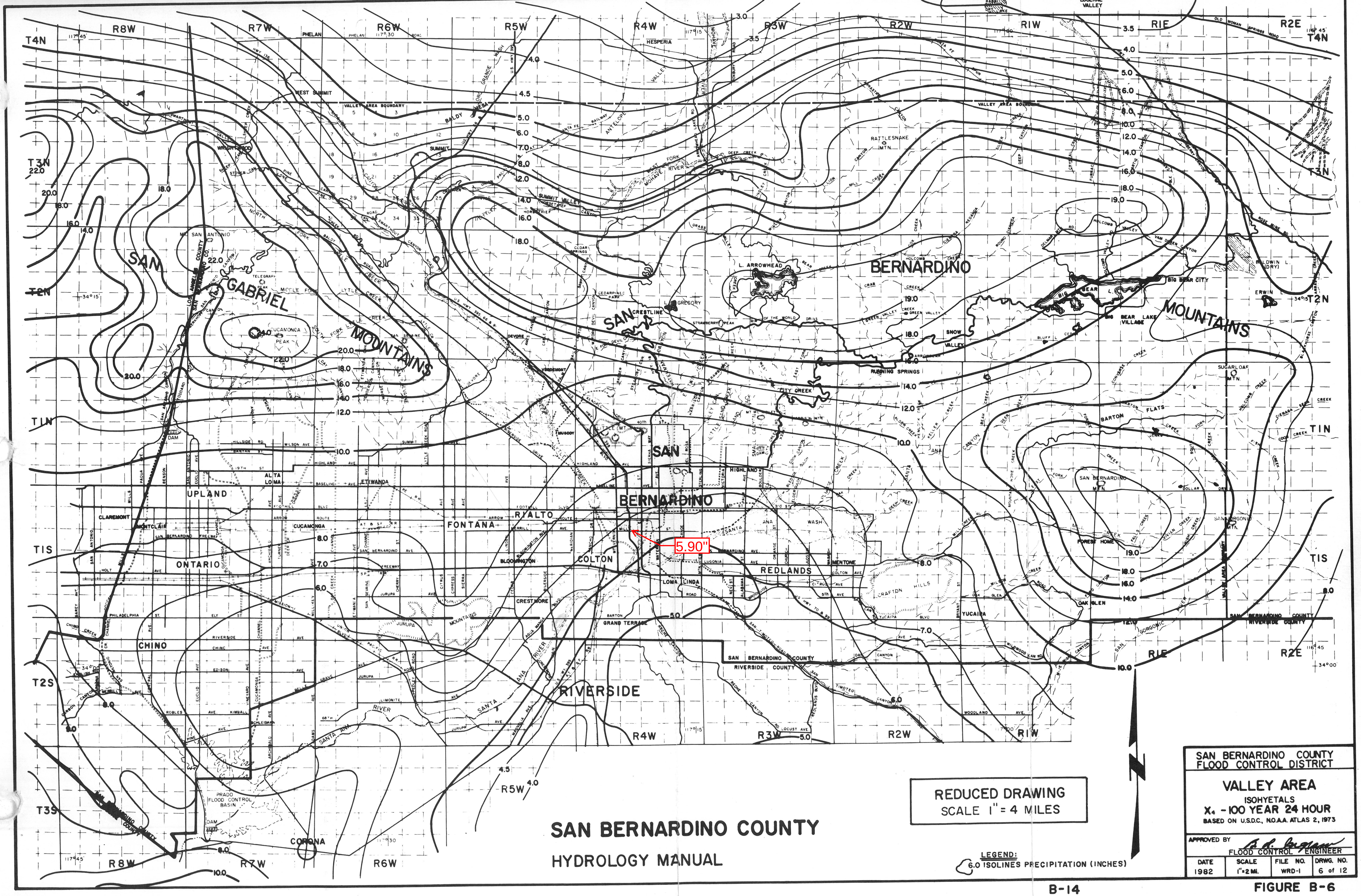
VALLEY AREA
ISOHYETALS
X_2 - 2 YEAR 24 HOUR
BASED ON U.S.D.C., N.O.A.A. ATLAS 2, 1973

APPROVED BY
FLOOD CONTROL ENGINEER

DATE	SCALE	FILE NO.	DRWG. NO.
1982	1"=2 MI.	WRD-1	2 of 12

WATER RESOURCES DIVISION

FIGURE B-2



SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

REDUCED DRAWING
SCALE 1" = 4 MILES

LEGEND:
6.0 ISOLINES PRECIPITATION (INCHES)

SAN BERNARDINO COUNTY
FLOOD CONTROL DISTRICT

VALLEY AREA
ISOHYETALS
X_4 -100 YEAR 24 HOUR
BASED ON U.S.D.C., N.O.A.A. ATLAS 2, 1973

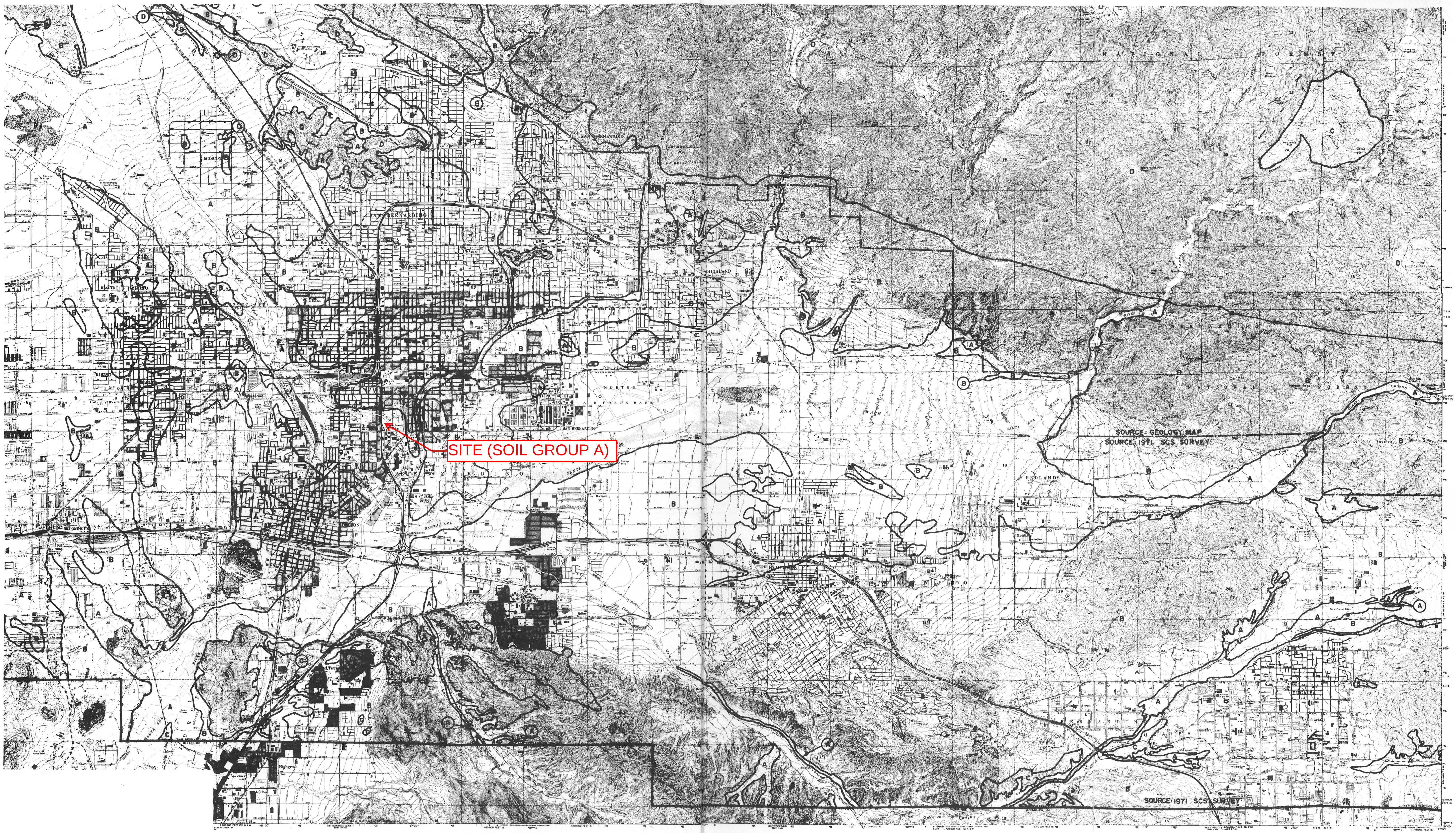
APPROVED BY B. L. Bingham
FLOOD CONTROL ENGINEER

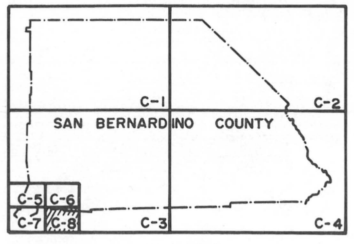
DATE	SCALE	FILE NO.	DRWG. NO.
1982	1"=2 MI.	WRD-1	6 of 12

FIGURE B-6

EXHIBIT “E”

San Bernardino County
Hydrology Manual
Soils Map

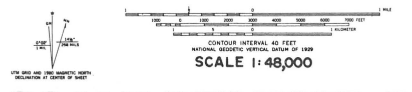




INDEX MAP

EGEND

————	SOIL GROUP BOUNDARY
A	SOIL GROUP DESIGNATION
—·—·—·—	BOUNDARY OF INDICATED SOURCE



SCALE 1:48,000

SCALE REDUCED BY 1/2

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

HYDROLOGIC SOILS GROUP MAP
FOR
SOUTHWEST-D AREA

FIGURE C-8

Residential Landscaping (Lawn, Shrubs, etc.) - The pervious portions of commercial establishments, single and multiple family dwellings, trailer parks and schools where the predominant land cover is lawn, shrubbery and trees.

Row Crops - Lettuce, tomatoes, beets, tulips or any field crop planted in rows far enough apart that most of the soil surface is exposed to rainfall impact throughout the growing season. At plowing, planting and harvest times it is equivalent to fallow.

Small Grain - Wheat, oats, barley, flax, etc. planted in rows close enough that the soil surface is not exposed except during planting and shortly thereafter.

Legumes - Alfalfa, sweetclover, timothy, etc. and combinations are either planted in close rows or broadcast.

Fallow - Fallow land is land plowed but not yet seeded or tilled.

Woodland - grass - Areas with an open cover of broadleaf or coniferous trees usually live oak and pines, with the intervening ground space occupied by annual grasses or weeds. The trees may occur singly or in small clumps. Canopy density, the amount of ground surface shaded at high noon, is from 20 to 50 percent.

Woodland - Areas on which coniferous or broadleaf trees predominate. The canopy density is at least 50 percent. Open areas may have a cover of annual or perennial grasses or of brush. Herbaceous plant cover under the trees is usually sparse because of leaf or needle litter accumulation.

Chaparral - Land on which the principal vegetation consists of evergreen shrubs with broad, hard, stiff leaves such as manzonita, ceanothus and scrub oak. The brush cover is usually dense or moderately dense. Diffusely branched evergreen shrubs with fine needle-like leaves, such as chamise and redchank, with dense high growth are also included in this soil cover.

Annual Grass - Land on which the principal vegetation consists of annual grasses and weeds such as annual bromes, wild barley, soft chess, ryegrass and filaree.

Irrigated Pasture - Irrigated land planted to perennial grasses and legumes for production of forage and which is cultivated only to establish or renew the stand of plants. Dry land pasture is considered as annual grass.

Meadow - Land areas with seasonally high water table, locally called cienegas. Principal vegetation consists of sod-forming grasses interspersed with other plants.

Orchard (Deciduous) - Land planted to such deciduous trees as apples, apricots, pears, walnuts, and almonds.

Orchard (Evergreen) - Land planted to evergreen trees which include citrus and avocados and coniferous plantings.

Turf - Golf courses, parks and similar lands where the predominant cover is irrigated mowed close-grown turf grass. Parks in which trees are dense may be classified as woodland.

SCS
COVER TYPE
DESCRIPTIONS

Figure C-2

POOR:	Heavily grazed or regularly burned areas. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.
FAIR:	Moderate cover with 50 percent to 75 percent of the ground surface protected by vegetation.
GOOD:	Heavy or dense cover with more than 75 percent of the ground surface protected by vegetation.

In most cases, watershed existing conditions cover type and quality can be readily determined by a field review of a watershed. In ultimate planned open spaces, the soil cover condition shall be considered as "good." Figure C-3 provides the CN values for various types and quality of ground cover. Impervious areas shall be assigned a CN of 98. It is noted that for ultimately developed conditions, the CN for urban landscaping (turf) is provided in Figure C-3.

C.4. WATERSHED DEVELOPMENT CONDITIONS

Ultimate development of the watershed should normally be assumed since watershed urbanization is reasonably likely within the expected life of most hydraulic facilities. Long range master plans for the County and incorporated cities should be reviewed to insure that reasonable land use assumptions are made for the ultimate development of the watershed. A field review shall also be made to confirm existing use and drainage patterns. Particular attention shall be paid to existing and proposed landscape practices, as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. Appropriate actual impervious percentages can then be selected from Figure C-4. It should be noted that the recommended values from these figures are for average conditions and, therefore, some adjustment for particular applications may be required.

Runoff Index Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group			
		A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparral, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparral, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	71	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent.)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	25	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		77	86	91	94

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

CURVE

NUMBERS FOR PERVIOUS AREAS

Runoff Index Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group			
		A	B	C	D
AGRICULTURAL COVERS (Continued)					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor Good	66 58	77 72	85 81	89 85
Orchards, Evergreen (Citrus, avocados, etc.)	Poor Fair Good	57 44 33	73 65 58	82 77 72	86 82 79
Pasture, Dryland (Annual grasses)	Poor Fair Good	68 49 39	79 69 61	86 79 74	89 84 80
Pasture, Irrigated (Legumes and perennial grass)	Poor Fair Good	58 44 33	74 65 58	83 77 72	87 82 79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor Good	72 67	81 78	88 85	91 89
Small grain (Wheat, oats, barley, etc.)	Poor Good	65 63	76 75	84 83	88 87

Notes:

1. All runoff index (RI) numbers are for Antecedent Moisture Condition (AMC) II.
2. Quality of cover definitions:

   Poor-Heavily grazed or regularly burned areas. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.

   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.

   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.
3. See Figure C-2 for definition of cover types.

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

NUMBERS
FOR
PERVIOUS AREAS

FIGURE C-3 (2 OF 2)

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent (2)
Natural or Agriculture	0 - 0	0
Public Park	10 - 25	15
School	30 - 50	40
Single Family Residential: (3)		
2.5 acre lots	5 - 15	10
1 acre lots	10 - 25	20
2 dwellings/acre	20 - 40	30
3-4 dwellings/acre	30 - 50	40
5-7 dwellings/acre	35 - 55	50
8-10 dwellings/acre	50 - 70	60
More than 10 dwellings/acre	65 - 90	80
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 shall 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 equestrian subdivisions increase impervious area 5 percent over the values recommended in the table above.

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

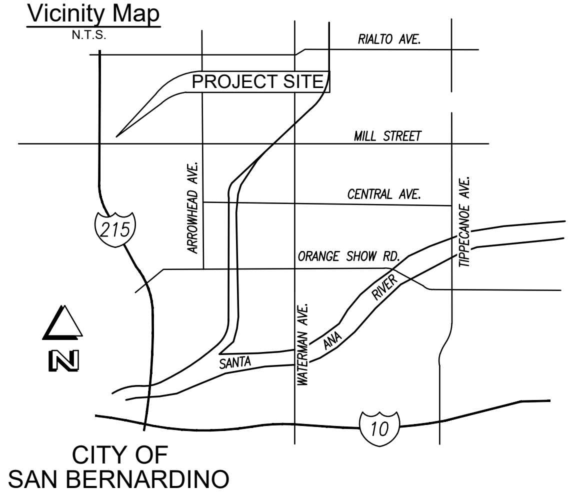
ACTUAL IMPERVIOUS COVER
FOR
DEVELOPED AREAS

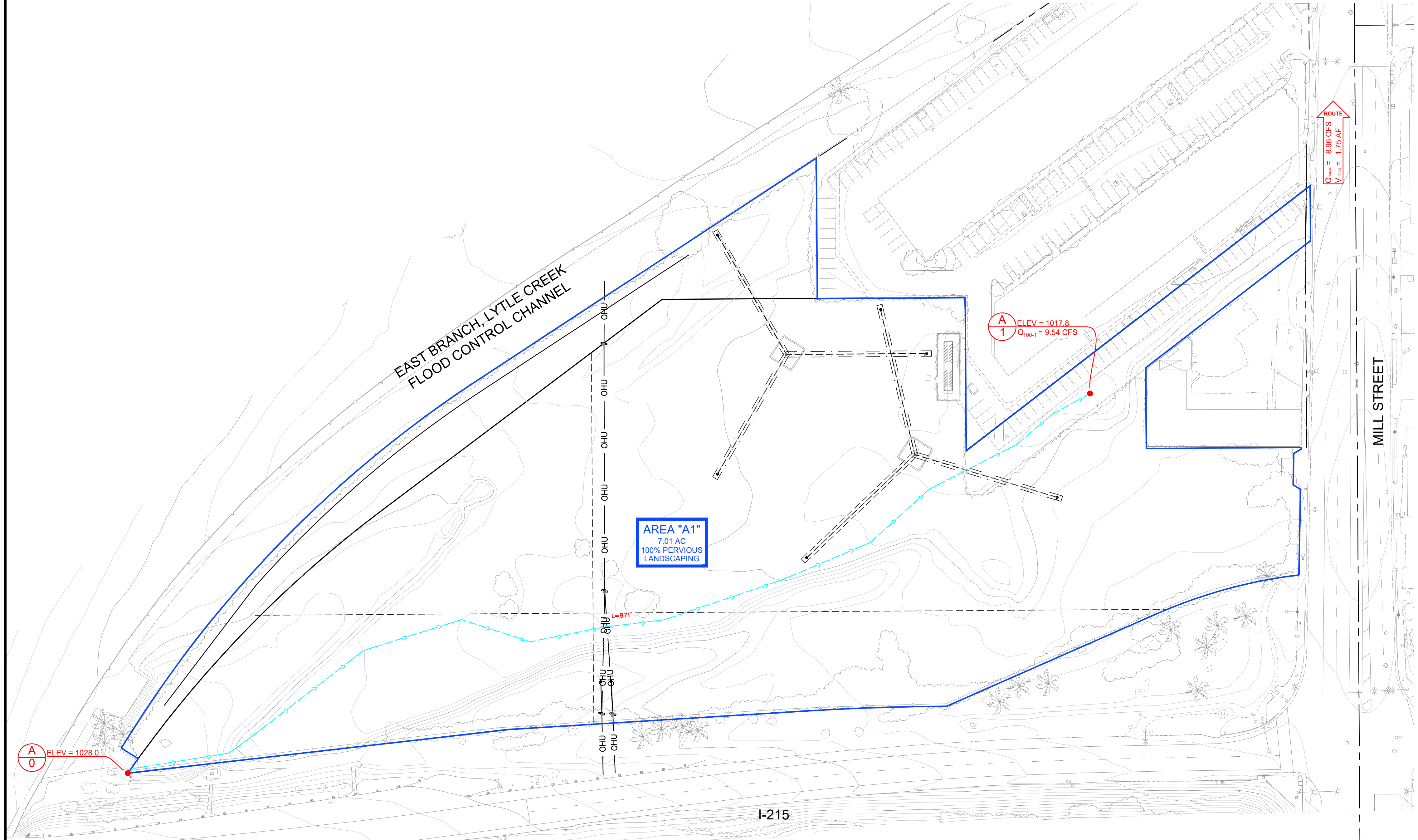
Figure C-4

EXHIBIT “F”

Existing Hydrologic Conditions
Study Map

EXHIBIT "F"
EXISTING CONDITION EXHIBIT
TEC EQUIPMENT
IN THE CITY & COUNTY OF SAN BERNARDINO, CA





MAP LEGEND

AREA "A"
1.00 AC
20% PERVIOUS
1 AC LOTS

DRAINAGE AREA,
SIZE, % IMPERVIOUS,
& CLOSEST APPROXIMATED
CLASSIFICATION

A 1.1 ELEV = 100.00
Q_{100} = 1.0CFS

RATIONAL METHOD
NODE LOCATION,
ELEVATION, & TOTAL
PEAK Q_{100-1}

Q_{100-24} = 1 CFS
V_{100-24} = 1 AF
ROUTE

UNIT HYDROGRAPH METHOD
TOTAL PEAK Q_{100-24}

DRAINAGE AREA LIMITS

FLOW PATHS

REDUCED

50 0 50 100 150

SCALE: 1"=50'

EXISTING CONDITION EXHIBIT
TEC EQUIPMENT
IN THE CITY & COUNTY OF SAN BERNARDINO, CA

PREPARED BY:

BONADIMAN
JOSEPH E. BONADIMAN & ASSOCIATES, INC.
ENGINEERS • G.I.S. • SURVEYING • PLANNING
TEL. (909) 885-3806
234 NORTH ARROWHEAD AVE.
SAN BERNARDINO, CA 92408
FAX (909) 381-1721
www.bonadiman.com

CIVILDESIGN
Software for Engineers, By Engineers

PREPARED FOR:

BY	MARK	REVISION DESCRIPTION	DATE

PREPARED FOR:	TEC EQUIPMENT
JOB NO:	204828
PREPARED BY:	JTS
CHECKED BY:	JTS

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EXISTING CONDITION EXHIBIT
TEC EQUIPMENT
IN THE CITY & COUNTY OF SAN BERNARDINO, CA

F

DISREGARD PRINTS BEARING
EARLIER REVISION DATES

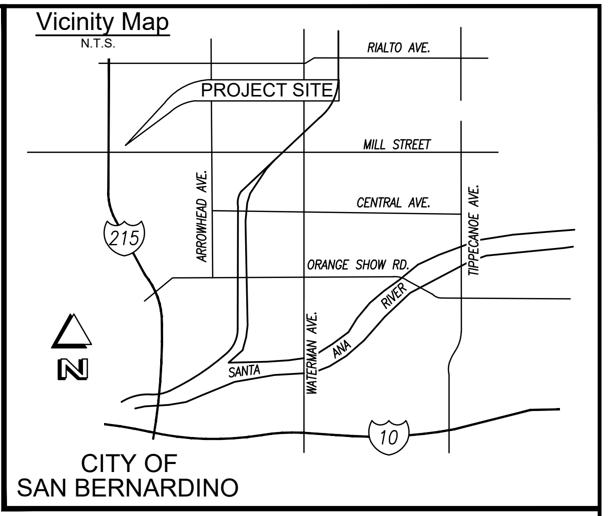
03-23-21

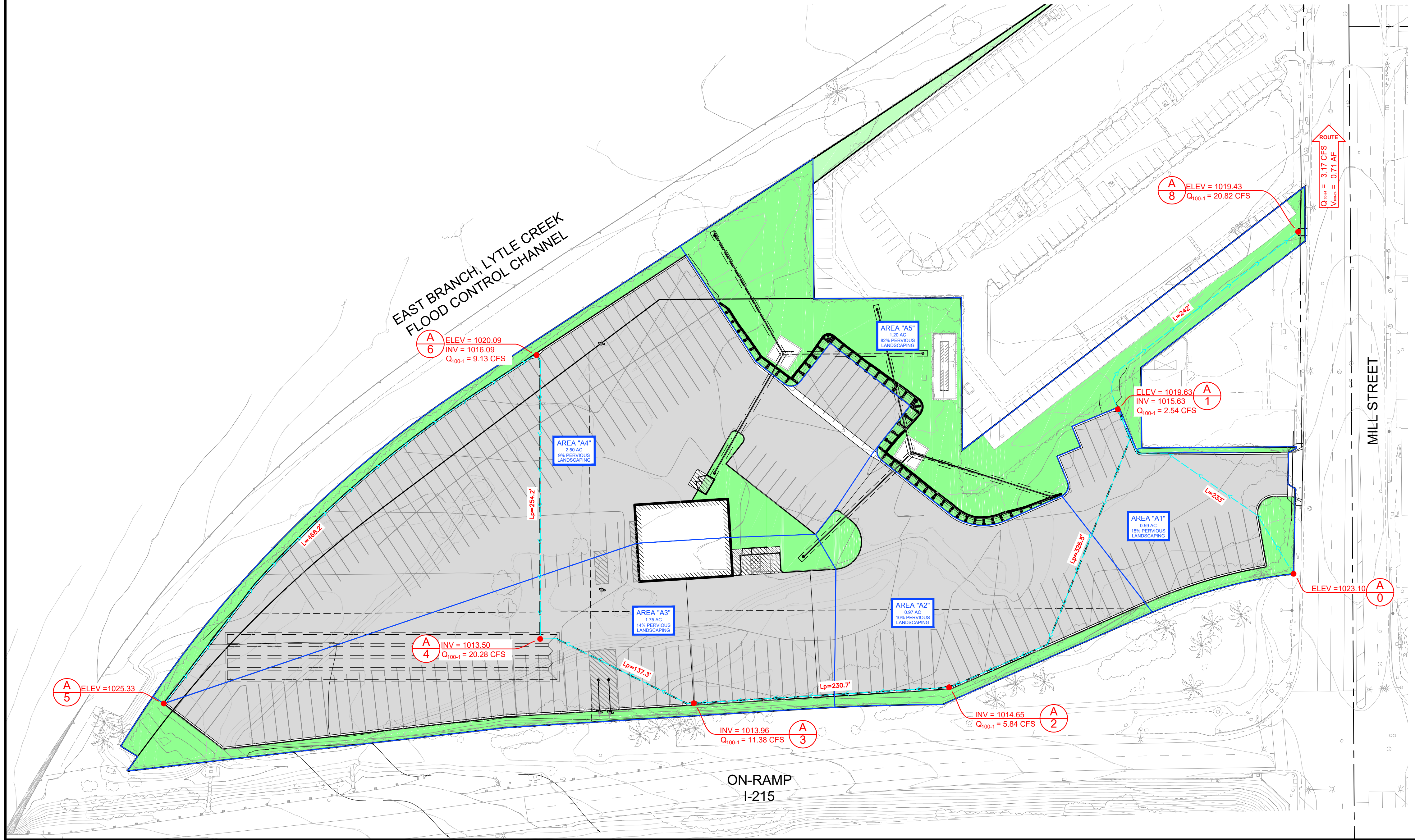
SHEET 1 OF 1

EXHIBIT “G”

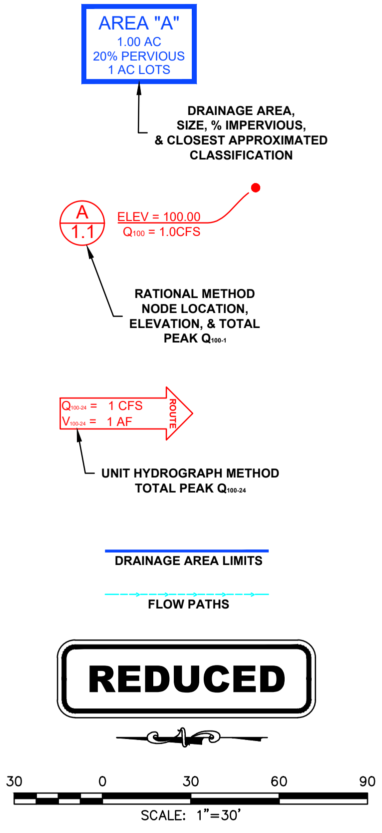
Developed Hydrologic Conditions Study Map

EXHIBIT "G"
DEVELOPED CONDITION EXHIBIT
TEC EQUIPMENT
IN THE CITY & COUNTY OF SAN BERNARDINO, CA





MAP LEGEND



DEVELOPED CONDITION EXHIBIT
TEC EQUIPMENT
IN THE CITY & COUNTY OF SAN BERNARDINO, CA

PREPARED BY:

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CIVILDESIGN
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BY	MARK	REVISION DESCRIPTION	DATE

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JOB NO:	204828
PREPARED BY:	JTS
CHECKED BY:	JTS

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DEVELOPED CONDITION EXHIBIT
TEC EQUIPMENT
IN THE CITY & COUNTY OF SAN BERNARDINO, CA

G

DISREGARD PRINTS BEARING EARLIER REVISION DATES ➡ 03-24-21

SHEET 1 OF 1

ATTACHMENT 1

Existing Conditions
Rational Method Calculations

```
                San Bernardino County Rational Hydrology Program

                    (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2019 Version 9.1
        Rational Hydrology Study        Date: 03/22/21
------------------------------------------------------------------------
204828 - TEC EQUIPMENT 776 MILL ST
EXISTING CONDITIONS
25-YEAR, 1-HOUR STORM
BY: JTS  DATE: 03-22-21
------------------------------------------------------------------------



Program License Serial Number 6320

------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------
Rational hydrology study storm event year is    25.0
   10 Year storm 1 hour rainfall  =      0.830(In.)
  100 Year storm 1 hour rainfall  =      1.280(In.)
Computed rainfall intensity:
Storm year =    25.00   1 hour rainfall =     1.009 (In.)
Slope used for rainfall intensity curve b =  0.6000
Soil antecedent moisture condition (AMC) = 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        0.000 to Point/Station        1.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.810(In/Hr)
Initial subarea data:
Initial area flow distance =   971.000(Ft.)
Top (of initial area) elevation =  1028.000(Ft.)
Bottom (of initial area) elevation =  1017.800(Ft.)
Difference in elevation =    10.200(Ft.)
Slope =    0.01050  s(%)=       1.05
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   27.505 min.
Rainfall intensity =      1.611(In/Hr) for a    25.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.448
Subarea runoff =      5.058(CFS)
Total initial stream area =        7.010(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.810(In/Hr)
End of computations, Total Study Area =            7.01 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged SCS curve number =  50.0
```

```
                San Bernardino County Rational Hydrology Program

                    (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2019 Version 9.1
        Rational Hydrology Study        Date: 03/22/21
------------------------------------------------------------------------
204828 - TEC EQUIPMENT 776 MILL ST
EXISTING CONDITIONS
100-YEAR, 1-HOUR STORM
BY: JTS  DATE: 03-22-21
------------------------------------------------------------------------


Program License Serial Number 6320

------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
   10 Year storm 1 hour rainfall  =      0.830(In.)
  100 Year storm 1 hour rainfall  =      1.280(In.)
Computed rainfall intensity:
Storm year =   100.00   1 hour rainfall =     1.280 (In.)
Slope used for rainfall intensity curve b =  0.6000
Soil antecedent moisture condition (AMC) = 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        0.000 to Point/Station        1.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.00
Adjusted SCS curve number for AMC 3 = 70.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.532(In/Hr)
Initial subarea data:
Initial area flow distance =   971.000(Ft.)
Top (of initial area) elevation =  1028.000(Ft.)
Bottom (of initial area) elevation =  1017.800(Ft.)
Difference in elevation =    10.200(Ft.)
Slope =    0.01050  s(%)=       1.05
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   27.505 min.
Rainfall intensity =      2.044(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.666
Subarea runoff =      9.535(CFS)
Total initial stream area =        7.010(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.532(In/Hr)
End of computations, Total Study Area =            7.01 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged SCS curve number =  50.0
```

ATTACHMENT 2

Existing Conditions
Unit Hydrograph Calculations

```
        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 - 2018, Version 9.0

                Study date  03/22/21


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
------------------------------------------------------------------------

San Bernardino County Synthetic Unit Hydrology Method
                Manual date - August 1986


Program License Serial Number 6320

---------------------------------------------------------------------
204828 - TEC EQUIPMENT 776 MILL ST
EXISITNG CONDITIONS
2-YEAR, 24-HOUR STORM
BY: JTS  DATE: 03-22-21
--------------------------------------------------------------------

        Storm Event Year = 2

        Antecedent Moisture Condition = 1

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format




Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 10
             7.01            1           0.83
--------------------------------------------------------------------
Rainfall data for year 2
             7.01            6           1.41
--------------------------------------------------------------------
Rainfall data for year 2
             7.01           24           2.40
--------------------------------------------------------------------
Rainfall data for year 100
             7.01            1           1.28
--------------------------------------------------------------------
Rainfall data for year 100
             7.01            6           2.60
--------------------------------------------------------------------
Rainfall data for year 100
             7.01           24           5.90
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 1)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 50.0      31.0          7.01      1.000     0.983    1.000    0.983

Area-averaged adjusted loss rate Fm (In/Hr) =  0.983

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC1)           Yield Fr
```

```
     7.01   1.000         50.0      31.0      12.00     0.000

Area-averaged catchment yield fraction, Y =  0.000
Area-averaged low loss fraction, Yb =  1.000
User entry of time of concentration  =   0.460 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       7.01(Ac.)
Catchment Lag time =   0.368 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 22.6449
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.983(In/Hr)
Average low loss rate fraction (Yb) = 1.000 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.191(In)
Computed peak 30-minute rainfall =  0.391(In)
Specified peak 1-hour rainfall =  0.515(In)
Computed peak 3-hour rainfall =  0.955(In)
Specified peak 6-hour rainfall =  1.410(In)
Specified peak 24-hour rainfall =  2.400(In)


Rainfall depth area reduction factors:
Using a total area of       7.01(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.191(In)
30-minute factor = 1.000    Adjusted rainfall =  0.391(In)
1-hour factor = 1.000       Adjusted rainfall =  0.515(In)
3-hour factor = 1.000       Adjusted rainfall =  0.955(In)
6-hour factor = 1.000       Adjusted rainfall =  1.410(In)
24-hour factor = 1.000      Adjusted rainfall =  2.400(In)
---------------------------------------------------------------------

                        U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
---------------------------------------------------------------------
                (K =        84.78 (CFS))

  1                2.049                1.737
  2                8.477                5.450
  3               19.785                9.587
  4               35.087               12.972
  5               50.623               13.171
  6               61.571                9.282
  7               68.622                5.977
  8               73.370                4.025
  9               76.878                2.974
 10               79.814                2.489
 11               82.277                2.088
 12               84.416                1.814
 13               86.277                1.577
 14               87.834                1.320
 15               89.201                1.159
 16               90.506                1.106
 17               91.540                0.877
 18               92.521                0.832
 19               93.306                0.665
 20               94.030                0.614
 21               94.727                0.591
 22               95.406                0.576
 23               96.009                0.511
 24               96.507                0.423
 25               96.983                0.403
 26               97.394                0.349
 27               97.790                0.336
 28               98.118                0.278
 29               98.431                0.265
 30               98.680                0.211
 31               98.907                0.192
 32               99.133                0.192
 33               99.360                0.192
```

```
 34               99.586                  0.192
 35               99.812                  0.192
 36              100.000                  0.159
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number              (In)                (In)
  1              0.1907               0.1907
  2              0.2516               0.0609
  3              0.2960               0.0443
  4              0.3321               0.0361
  5              0.3631               0.0310
  6              0.3905               0.0275
  7              0.4154               0.0248
  8              0.4381               0.0228
  9              0.4593               0.0211
 10              0.4791               0.0198
 11              0.4977               0.0186
 12              0.5153               0.0176
 13              0.5390               0.0237
 14              0.5619               0.0229
 15              0.5841               0.0222
 16              0.6057               0.0216
 17              0.6267               0.0210
 18              0.6471               0.0205
 19              0.6671               0.0200
 20              0.6866               0.0195
 21              0.7057               0.0191
 22              0.7244               0.0187
 23              0.7427               0.0183
 24              0.7607               0.0180
 25              0.7783               0.0176
 26              0.7957               0.0173
 27              0.8127               0.0171
 28              0.8295               0.0168
 29              0.8460               0.0165
 30              0.8623               0.0163
 31              0.8783               0.0160
 32              0.8941               0.0158
 33              0.9097               0.0156
 34              0.9251               0.0154
 35              0.9403               0.0152
 36              0.9553               0.0150
 37              0.9701               0.0148
 38              0.9848               0.0146
 39              0.9992               0.0145
 40              1.0135               0.0143
 41              1.0277               0.0142
 42              1.0417               0.0140
 43              1.0555               0.0139
 44              1.0693               0.0137
 45              1.0828               0.0136
 46              1.0963               0.0134
 47              1.1096               0.0133
 48              1.1228               0.0132
 49              1.1359               0.0131
 50              1.1489               0.0130
 51              1.1617               0.0128
 52              1.1744               0.0127
 53              1.1871               0.0126
 54              1.1996               0.0125
 55              1.2120               0.0124
 56              1.2244               0.0123
 57              1.2366               0.0122
 58              1.2487               0.0121
 59              1.2608               0.0120
 60              1.2727               0.0120
 61              1.2846               0.0119
 62              1.2964               0.0118
 63              1.3081               0.0117
 64              1.3197               0.0116
 65              1.3313               0.0115
 66              1.3427               0.0115
 67              1.3541               0.0114
```

68	1.3654	0.0113
69	1.3767	0.0112
70	1.3878	0.0112
71	1.3989	0.0111
72	1.4100	0.0110
73	1.4175	0.0075
74	1.4249	0.0074
75	1.4322	0.0074
76	1.4395	0.0073
77	1.4468	0.0072
78	1.4539	0.0072
79	1.4611	0.0071
80	1.4681	0.0071
81	1.4751	0.0070
82	1.4821	0.0070
83	1.4890	0.0069
84	1.4959	0.0069
85	1.5027	0.0068
86	1.5094	0.0068
87	1.5162	0.0067
88	1.5228	0.0067
89	1.5294	0.0066
90	1.5360	0.0066
91	1.5425	0.0065
92	1.5490	0.0065
93	1.5554	0.0064
94	1.5618	0.0064
95	1.5682	0.0064
96	1.5745	0.0063
97	1.5808	0.0063
98	1.5870	0.0062
99	1.5932	0.0062
100	1.5994	0.0062
101	1.6055	0.0061
102	1.6116	0.0061
103	1.6176	0.0060
104	1.6236	0.0060
105	1.6296	0.0060
106	1.6355	0.0059
107	1.6414	0.0059
108	1.6473	0.0059
109	1.6531	0.0058
110	1.6589	0.0058
111	1.6647	0.0058
112	1.6704	0.0057
113	1.6762	0.0057
114	1.6818	0.0057
115	1.6875	0.0056
116	1.6931	0.0056
117	1.6987	0.0056
118	1.7042	0.0056
119	1.7098	0.0055
120	1.7153	0.0055
121	1.7207	0.0055
122	1.7262	0.0054
123	1.7316	0.0054
124	1.7370	0.0054
125	1.7423	0.0054
126	1.7477	0.0053
127	1.7530	0.0053
128	1.7583	0.0053
129	1.7635	0.0053
130	1.7687	0.0052
131	1.7740	0.0052
132	1.7791	0.0052
133	1.7843	0.0052
134	1.7894	0.0051
135	1.7945	0.0051
136	1.7996	0.0051
137	1.8047	0.0051
138	1.8097	0.0050
139	1.8148	0.0050
140	1.8198	0.0050

141	1.8247	0.0050
142	1.8297	0.0050
143	1.8346	0.0049
144	1.8395	0.0049
145	1.8444	0.0049
146	1.8493	0.0049
147	1.8541	0.0048
148	1.8590	0.0048
149	1.8638	0.0048
150	1.8686	0.0048
151	1.8733	0.0048
152	1.8781	0.0048
153	1.8828	0.0047
154	1.8875	0.0047
155	1.8922	0.0047
156	1.8969	0.0047
157	1.9016	0.0047
158	1.9062	0.0046
159	1.9108	0.0046
160	1.9154	0.0046
161	1.9200	0.0046
162	1.9246	0.0046
163	1.9291	0.0045
164	1.9337	0.0045
165	1.9382	0.0045
166	1.9427	0.0045
167	1.9472	0.0045
168	1.9516	0.0045
169	1.9561	0.0044
170	1.9605	0.0044
171	1.9649	0.0044
172	1.9693	0.0044
173	1.9737	0.0044
174	1.9781	0.0044
175	1.9824	0.0044
176	1.9868	0.0043
177	1.9911	0.0043
178	1.9954	0.0043
179	1.9997	0.0043
180	2.0040	0.0043
181	2.0082	0.0043
182	2.0125	0.0042
183	2.0167	0.0042
184	2.0209	0.0042
185	2.0251	0.0042
186	2.0293	0.0042
187	2.0335	0.0042
188	2.0377	0.0042
189	2.0418	0.0042
190	2.0460	0.0041
191	2.0501	0.0041
192	2.0542	0.0041
193	2.0583	0.0041
194	2.0624	0.0041
195	2.0665	0.0041
196	2.0705	0.0041
197	2.0746	0.0040
198	2.0786	0.0040
199	2.0826	0.0040
200	2.0866	0.0040
201	2.0906	0.0040
202	2.0946	0.0040
203	2.0986	0.0040
204	2.1026	0.0040
205	2.1065	0.0039
206	2.1104	0.0039
207	2.1144	0.0039
208	2.1183	0.0039
209	2.1222	0.0039
210	2.1261	0.0039
211	2.1299	0.0039
212	2.1338	0.0039
213	2.1377	0.0039

214	2.1415	0.0038
215	2.1453	0.0038
216	2.1492	0.0038
217	2.1530	0.0038
218	2.1568	0.0038
219	2.1606	0.0038
220	2.1644	0.0038
221	2.1681	0.0038
222	2.1719	0.0038
223	2.1756	0.0037
224	2.1794	0.0037
225	2.1831	0.0037
226	2.1868	0.0037
227	2.1905	0.0037
228	2.1942	0.0037
229	2.1979	0.0037
230	2.2016	0.0037
231	2.2053	0.0037
232	2.2089	0.0037
233	2.2126	0.0036
234	2.2162	0.0036
235	2.2198	0.0036
236	2.2234	0.0036
237	2.2271	0.0036
238	2.2307	0.0036
239	2.2342	0.0036
240	2.2378	0.0036
241	2.2414	0.0036
242	2.2450	0.0036
243	2.2485	0.0036
244	2.2521	0.0035
245	2.2556	0.0035
246	2.2591	0.0035
247	2.2627	0.0035
248	2.2662	0.0035
249	2.2697	0.0035
250	2.2732	0.0035
251	2.2766	0.0035
252	2.2801	0.0035
253	2.2836	0.0035
254	2.2870	0.0035
255	2.2905	0.0035
256	2.2939	0.0034
257	2.2974	0.0034
258	2.3008	0.0034
259	2.3042	0.0034
260	2.3076	0.0034
261	2.3110	0.0034
262	2.3144	0.0034
263	2.3178	0.0034
264	2.3212	0.0034
265	2.3245	0.0034
266	2.3279	0.0034
267	2.3313	0.0034
268	2.3346	0.0033
269	2.3379	0.0033
270	2.3413	0.0033
271	2.3446	0.0033
272	2.3479	0.0033
273	2.3512	0.0033
274	2.3545	0.0033
275	2.3578	0.0033
276	2.3611	0.0033
277	2.3644	0.0033
278	2.3677	0.0033
279	2.3709	0.0033
280	2.3742	0.0033
281	2.3774	0.0032
282	2.3807	0.0032
283	2.3839	0.0032
284	2.3871	0.0032
285	2.3904	0.0032
286	2.3936	0.0032

```
287              2.3968               0.0032
288              2.4000               0.0032
---------------------------------------------------------------------
Unit              Unit            Unit              Effective
Period            Rainfall        Soil-Loss         Rainfall
(number)            (In)          (In)                 (In)
---------------------------------------------------------------------
  1              0.0032           0.0032              0.0000
  2              0.0032           0.0032              0.0000
  3              0.0032           0.0032              0.0000
  4              0.0032           0.0032              0.0000
  5              0.0032           0.0032              0.0000
  6              0.0032           0.0032              0.0000
  7              0.0033           0.0033              0.0000
  8              0.0033           0.0033              0.0000
  9              0.0033           0.0033              0.0000
 10              0.0033           0.0033              0.0000
 11              0.0033           0.0033              0.0000
 12              0.0033           0.0033              0.0000
 13              0.0033           0.0033              0.0000
 14              0.0033           0.0033              0.0000
 15              0.0034           0.0034              0.0000
 16              0.0034           0.0034              0.0000
 17              0.0034           0.0034              0.0000
 18              0.0034           0.0034              0.0000
 19              0.0034           0.0034              0.0000
 20              0.0034           0.0034              0.0000
 21              0.0034           0.0034              0.0000
 22              0.0034           0.0034              0.0000
 23              0.0035           0.0035              0.0000
 24              0.0035           0.0035              0.0000
 25              0.0035           0.0035              0.0000
 26              0.0035           0.0035              0.0000
 27              0.0035           0.0035              0.0000
 28              0.0035           0.0035              0.0000
 29              0.0035           0.0035              0.0000
 30              0.0035           0.0035              0.0000
 31              0.0036           0.0036              0.0000
 32              0.0036           0.0036              0.0000
 33              0.0036           0.0036              0.0000
 34              0.0036           0.0036              0.0000
 35              0.0036           0.0036              0.0000
 36              0.0036           0.0036              0.0000
 37              0.0036           0.0036              0.0000
 38              0.0036           0.0036              0.0000
 39              0.0037           0.0037              0.0000
 40              0.0037           0.0037              0.0000
 41              0.0037           0.0037              0.0000
 42              0.0037           0.0037              0.0000
 43              0.0037           0.0037              0.0000
 44              0.0037           0.0037              0.0000
 45              0.0038           0.0038              0.0000
 46              0.0038           0.0038              0.0000
 47              0.0038           0.0038              0.0000
 48              0.0038           0.0038              0.0000
 49              0.0038           0.0038              0.0000
 50              0.0038           0.0038              0.0000
 51              0.0039           0.0039              0.0000
 52              0.0039           0.0039              0.0000
 53              0.0039           0.0039              0.0000
 54              0.0039           0.0039              0.0000
 55              0.0039           0.0039              0.0000
 56              0.0039           0.0039              0.0000
 57              0.0040           0.0040              0.0000
 58              0.0040           0.0040              0.0000
 59              0.0040           0.0040              0.0000
 60              0.0040           0.0040              0.0000
 61              0.0040           0.0040              0.0000
 62              0.0040           0.0040              0.0000
 63              0.0041           0.0041              0.0000
 64              0.0041           0.0041              0.0000
 65              0.0041           0.0041              0.0000
 66              0.0041           0.0041              0.0000
```

67	0.0042	0.0042	0.0000
68	0.0042	0.0042	0.0000
69	0.0042	0.0042	0.0000
70	0.0042	0.0042	0.0000
71	0.0042	0.0042	0.0000
72	0.0042	0.0042	0.0000
73	0.0043	0.0043	0.0000
74	0.0043	0.0043	0.0000
75	0.0043	0.0043	0.0000
76	0.0043	0.0043	0.0000
77	0.0044	0.0044	0.0000
78	0.0044	0.0044	0.0000
79	0.0044	0.0044	0.0000
80	0.0044	0.0044	0.0000
81	0.0045	0.0045	0.0000
82	0.0045	0.0045	0.0000
83	0.0045	0.0045	0.0000
84	0.0045	0.0045	0.0000
85	0.0046	0.0046	0.0000
86	0.0046	0.0046	0.0000
87	0.0046	0.0046	0.0000
88	0.0046	0.0046	0.0000
89	0.0047	0.0047	0.0000
90	0.0047	0.0047	0.0000
91	0.0047	0.0047	0.0000
92	0.0048	0.0048	0.0000
93	0.0048	0.0048	0.0000
94	0.0048	0.0048	0.0000
95	0.0048	0.0048	0.0000
96	0.0049	0.0049	0.0000
97	0.0049	0.0049	0.0000
98	0.0049	0.0049	0.0000
99	0.0050	0.0050	0.0000
100	0.0050	0.0050	0.0000
101	0.0050	0.0050	0.0000
102	0.0051	0.0051	0.0000
103	0.0051	0.0051	0.0000
104	0.0051	0.0051	0.0000
105	0.0052	0.0052	0.0000
106	0.0052	0.0052	0.0000
107	0.0053	0.0053	0.0000
108	0.0053	0.0053	0.0000
109	0.0053	0.0053	0.0000
110	0.0054	0.0054	0.0000
111	0.0054	0.0054	0.0000
112	0.0054	0.0054	0.0000
113	0.0055	0.0055	0.0000
114	0.0055	0.0055	0.0000
115	0.0056	0.0056	0.0000
116	0.0056	0.0056	0.0000
117	0.0057	0.0057	0.0000
118	0.0057	0.0057	0.0000
119	0.0058	0.0058	0.0000
120	0.0058	0.0058	0.0000
121	0.0059	0.0059	0.0000
122	0.0059	0.0059	0.0000
123	0.0060	0.0060	0.0000
124	0.0060	0.0060	0.0000
125	0.0061	0.0061	0.0000
126	0.0061	0.0061	0.0000
127	0.0062	0.0062	0.0000
128	0.0062	0.0062	0.0000
129	0.0063	0.0063	0.0000
130	0.0064	0.0064	0.0000
131	0.0064	0.0064	0.0000
132	0.0065	0.0065	0.0000
133	0.0066	0.0066	0.0000
134	0.0066	0.0066	0.0000
135	0.0067	0.0067	0.0000
136	0.0068	0.0068	0.0000
137	0.0069	0.0069	0.0000
138	0.0069	0.0069	0.0000
139	0.0070	0.0070	0.0000

140	0.0071	0.0071	0.0000
141	0.0072	0.0072	0.0000
142	0.0072	0.0072	0.0000
143	0.0074	0.0074	0.0000
144	0.0074	0.0074	0.0000
145	0.0110	0.0110	0.0000
146	0.0111	0.0111	0.0000
147	0.0112	0.0112	0.0000
148	0.0113	0.0113	0.0000
149	0.0115	0.0115	0.0000
150	0.0115	0.0115	0.0000
151	0.0117	0.0117	0.0000
152	0.0118	0.0118	0.0000
153	0.0120	0.0120	0.0000
154	0.0120	0.0120	0.0000
155	0.0122	0.0122	0.0000
156	0.0123	0.0123	0.0000
157	0.0125	0.0125	0.0000
158	0.0126	0.0126	0.0000
159	0.0128	0.0128	0.0000
160	0.0130	0.0130	0.0000
161	0.0132	0.0132	0.0000
162	0.0133	0.0133	0.0000
163	0.0136	0.0136	0.0000
164	0.0137	0.0137	0.0000
165	0.0140	0.0140	0.0000
166	0.0142	0.0142	0.0000
167	0.0145	0.0145	0.0000
168	0.0146	0.0146	0.0000
169	0.0150	0.0150	0.0000
170	0.0152	0.0152	0.0000
171	0.0156	0.0156	0.0000
172	0.0158	0.0158	0.0000
173	0.0163	0.0163	0.0000
174	0.0165	0.0165	0.0000
175	0.0171	0.0171	0.0000
176	0.0173	0.0173	0.0000
177	0.0180	0.0180	0.0000
178	0.0183	0.0183	0.0000
179	0.0191	0.0191	0.0000
180	0.0195	0.0195	0.0000
181	0.0205	0.0205	0.0000
182	0.0210	0.0210	0.0000
183	0.0222	0.0222	0.0000
184	0.0229	0.0229	0.0000
185	0.0176	0.0176	0.0000
186	0.0186	0.0186	0.0000
187	0.0211	0.0211	0.0000
188	0.0228	0.0228	0.0000
189	0.0275	0.0275	0.0000
190	0.0310	0.0310	0.0000
191	0.0443	0.0443	0.0000
192	0.0609	0.0609	0.0000
193	0.1907	0.0819	0.1088
194	0.0361	0.0361	0.0000
195	0.0248	0.0248	0.0000
196	0.0198	0.0198	0.0000
197	0.0237	0.0237	0.0000
198	0.0216	0.0216	0.0000
199	0.0200	0.0200	0.0000
200	0.0187	0.0187	0.0000
201	0.0176	0.0176	0.0000
202	0.0168	0.0168	0.0000
203	0.0160	0.0160	0.0000
204	0.0154	0.0154	0.0000
205	0.0148	0.0148	0.0000
206	0.0143	0.0143	0.0000
207	0.0139	0.0139	0.0000
208	0.0134	0.0134	0.0000
209	0.0131	0.0131	0.0000
210	0.0127	0.0127	0.0000
211	0.0124	0.0124	0.0000
212	0.0121	0.0121	0.0000

213	0.0119	0.0119	0.0000
214	0.0116	0.0116	0.0000
215	0.0114	0.0114	0.0000
216	0.0112	0.0112	0.0000
217	0.0075	0.0075	0.0000
218	0.0073	0.0073	0.0000
219	0.0071	0.0071	0.0000
220	0.0070	0.0070	0.0000
221	0.0068	0.0068	0.0000
222	0.0067	0.0067	0.0000
223	0.0065	0.0065	0.0000
224	0.0064	0.0064	0.0000
225	0.0063	0.0063	0.0000
226	0.0062	0.0062	0.0000
227	0.0060	0.0060	0.0000
228	0.0059	0.0059	0.0000
229	0.0058	0.0058	0.0000
230	0.0057	0.0057	0.0000
231	0.0056	0.0056	0.0000
232	0.0056	0.0056	0.0000
233	0.0055	0.0055	0.0000
234	0.0054	0.0054	0.0000
235	0.0053	0.0053	0.0000
236	0.0052	0.0052	0.0000
237	0.0052	0.0052	0.0000
238	0.0051	0.0051	0.0000
239	0.0050	0.0050	0.0000
240	0.0050	0.0050	0.0000
241	0.0049	0.0049	0.0000
242	0.0048	0.0048	0.0000
243	0.0048	0.0048	0.0000
244	0.0047	0.0047	0.0000
245	0.0047	0.0047	0.0000
246	0.0046	0.0046	0.0000
247	0.0045	0.0045	0.0000
248	0.0045	0.0045	0.0000
249	0.0044	0.0044	0.0000
250	0.0044	0.0044	0.0000
251	0.0044	0.0044	0.0000
252	0.0043	0.0043	0.0000
253	0.0043	0.0043	0.0000
254	0.0042	0.0042	0.0000
255	0.0042	0.0042	0.0000
256	0.0041	0.0041	0.0000
257	0.0041	0.0041	0.0000
258	0.0041	0.0041	0.0000
259	0.0040	0.0040	0.0000
260	0.0040	0.0040	0.0000
261	0.0039	0.0039	0.0000
262	0.0039	0.0039	0.0000
263	0.0039	0.0039	0.0000
264	0.0038	0.0038	0.0000
265	0.0038	0.0038	0.0000
266	0.0038	0.0038	0.0000
267	0.0037	0.0037	0.0000
268	0.0037	0.0037	0.0000
269	0.0037	0.0037	0.0000
270	0.0037	0.0037	0.0000
271	0.0036	0.0036	0.0000
272	0.0036	0.0036	0.0000
273	0.0036	0.0036	0.0000
274	0.0035	0.0035	0.0000
275	0.0035	0.0035	0.0000
276	0.0035	0.0035	0.0000
277	0.0035	0.0035	0.0000
278	0.0034	0.0034	0.0000
279	0.0034	0.0034	0.0000
280	0.0034	0.0034	0.0000
281	0.0034	0.0034	0.0000
282	0.0033	0.0033	0.0000
283	0.0033	0.0033	0.0000
284	0.0033	0.0033	0.0000
285	0.0033	0.0033	0.0000

```
      286              0.0033           0.0033              0.0000
      287              0.0032           0.0032              0.0000
      288              0.0032           0.0032              0.0000
      --------------------------------------------------------------------
      --------------------------------------------------------------------
      Total soil rain loss =      2.29(In)
      Total effective rainfall =      0.11(In)
      Peak flow rate in flood hydrograph =      1.43(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
-----------------------------------------------------------------------
  0+ 5       0.0000      0.00  Q          |         |         |         |
  0+10       0.0000      0.00  Q          |         |         |         |
  0+15       0.0000      0.00  Q          |         |         |         |
  0+20       0.0000      0.00  Q          |         |         |         |
  0+25       0.0000      0.00  Q          |         |         |         |
  0+30       0.0000      0.00  Q          |         |         |         |
  0+35       0.0000      0.00  Q          |         |         |         |
  0+40       0.0000      0.00  Q          |         |         |         |
  0+45       0.0000      0.00  Q          |         |         |         |
  0+50       0.0000      0.00  Q          |         |         |         |
  0+55       0.0000      0.00  Q          |         |         |         |
  1+ 0       0.0000      0.00  Q          |         |         |         |
  1+ 5       0.0000      0.00  Q          |         |         |         |
  1+10       0.0000      0.00  Q          |         |         |         |
  1+15       0.0000      0.00  Q          |         |         |         |
  1+20       0.0000      0.00  Q          |         |         |         |
  1+25       0.0000      0.00  Q          |         |         |         |
  1+30       0.0000      0.00  Q          |         |         |         |
  1+35       0.0000      0.00  Q          |         |         |         |
  1+40       0.0000      0.00  Q          |         |         |         |
  1+45       0.0000      0.00  Q          |         |         |         |
  1+50       0.0000      0.00  Q          |         |         |         |
  1+55       0.0000      0.00  Q          |         |         |         |
  2+ 0       0.0000      0.00  Q          |         |         |         |
  2+ 5       0.0000      0.00  Q          |         |         |         |
  2+10       0.0000      0.00  Q          |         |         |         |
  2+15       0.0000      0.00  Q          |         |         |         |
  2+20       0.0000      0.00  Q          |         |         |         |
  2+25       0.0000      0.00  Q          |         |         |         |
  2+30       0.0000      0.00  Q          |         |         |         |
  2+35       0.0000      0.00  Q          |         |         |         |
  2+40       0.0000      0.00  Q          |         |         |         |
  2+45       0.0000      0.00  Q          |         |         |         |
  2+50       0.0000      0.00  Q          |         |         |         |
  2+55       0.0000      0.00  Q          |         |         |         |
  3+ 0       0.0000      0.00  Q          |         |         |         |
  3+ 5       0.0000      0.00  Q          |         |         |         |
  3+10       0.0000      0.00  Q          |         |         |         |
  3+15       0.0000      0.00  Q          |         |         |         |
  3+20       0.0000      0.00  Q          |         |         |         |
  3+25       0.0000      0.00  Q          |         |         |         |
  3+30       0.0000      0.00  Q          |         |         |         |
  3+35       0.0000      0.00  Q          |         |         |         |
  3+40       0.0000      0.00  Q          |         |         |         |
  3+45       0.0000      0.00  Q          |         |         |         |
  3+50       0.0000      0.00  Q          |         |         |         |
  3+55       0.0000      0.00  Q          |         |         |         |
  4+ 0       0.0000      0.00  Q          |         |         |         |
  4+ 5       0.0000      0.00  Q          |         |         |         |
  4+10       0.0000      0.00  Q          |         |         |         |
  4+15       0.0000      0.00  Q          |         |         |         |
  4+20       0.0000      0.00  Q          |         |         |         |
  4+25       0.0000      0.00  Q          |         |         |         |
  4+30       0.0000      0.00  Q          |         |         |         |
  4+35       0.0000      0.00  Q          |         |         |         |
```

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  4+40        0.0000      0.00  Q          |          |          |          |
  4+45        0.0000      0.00  Q          |          |          |          |
  4+50        0.0000      0.00  Q          |          |          |          |
  4+55        0.0000      0.00  Q          |          |          |          |
  5+ 0        0.0000      0.00  Q          |          |          |          |
  5+ 5        0.0000      0.00  Q          |          |          |          |
  5+10        0.0000      0.00  Q          |          |          |          |
  5+15        0.0000      0.00  Q          |          |          |          |
  5+20        0.0000      0.00  Q          |          |          |          |
  5+25        0.0000      0.00  Q          |          |          |          |
  5+30        0.0000      0.00  Q          |          |          |          |
  5+35        0.0000      0.00  Q          |          |          |          |
  5+40        0.0000      0.00  Q          |          |          |          |
  5+45        0.0000      0.00  Q          |          |          |          |
  5+50        0.0000      0.00  Q          |          |          |          |
  5+55        0.0000      0.00  Q          |          |          |          |
  6+ 0        0.0000      0.00  Q          |          |          |          |
  6+ 5        0.0000      0.00  Q          |          |          |          |
  6+10        0.0000      0.00  Q          |          |          |          |
  6+15        0.0000      0.00  Q          |          |          |          |
  6+20        0.0000      0.00  Q          |          |          |          |
  6+25        0.0000      0.00  Q          |          |          |          |
  6+30        0.0000      0.00  Q          |          |          |          |
  6+35        0.0000      0.00  Q          |          |          |          |
  6+40        0.0000      0.00  Q          |          |          |          |
  6+45        0.0000      0.00  Q          |          |          |          |
  6+50        0.0000      0.00  Q          |          |          |          |
  6+55        0.0000      0.00  Q          |          |          |          |
  7+ 0        0.0000      0.00  Q          |          |          |          |
  7+ 5        0.0000      0.00  Q          |          |          |          |
  7+10        0.0000      0.00  Q          |          |          |          |
  7+15        0.0000      0.00  Q          |          |          |          |
  7+20        0.0000      0.00  Q          |          |          |          |
  7+25        0.0000      0.00  Q          |          |          |          |
  7+30        0.0000      0.00  Q          |          |          |          |
  7+35        0.0000      0.00  Q          |          |          |          |
  7+40        0.0000      0.00  Q          |          |          |          |
  7+45        0.0000      0.00  Q          |          |          |          |
  7+50        0.0000      0.00  Q          |          |          |          |
  7+55        0.0000      0.00  Q          |          |          |          |
  8+ 0        0.0000      0.00  Q          |          |          |          |
  8+ 5        0.0000      0.00  Q          |          |          |          |
  8+10        0.0000      0.00  Q          |          |          |          |
  8+15        0.0000      0.00  Q          |          |          |          |
  8+20        0.0000      0.00  Q          |          |          |          |
  8+25        0.0000      0.00  Q          |          |          |          |
  8+30        0.0000      0.00  Q          |          |          |          |
  8+35        0.0000      0.00  Q          |          |          |          |
  8+40        0.0000      0.00  Q          |          |          |          |
  8+45        0.0000      0.00  Q          |          |          |          |
  8+50        0.0000      0.00  Q          |          |          |          |
  8+55        0.0000      0.00  Q          |          |          |          |
  9+ 0        0.0000      0.00  Q          |          |          |          |
  9+ 5        0.0000      0.00  Q          |          |          |          |
  9+10        0.0000      0.00  Q          |          |          |          |
  9+15        0.0000      0.00  Q          |          |          |          |
  9+20        0.0000      0.00  Q          |          |          |          |
  9+25        0.0000      0.00  Q          |          |          |          |
  9+30        0.0000      0.00  Q          |          |          |          |
  9+35        0.0000      0.00  Q          |          |          |          |
  9+40        0.0000      0.00  Q          |          |          |          |
  9+45        0.0000      0.00  Q          |          |          |          |
  9+50        0.0000      0.00  Q          |          |          |          |
  9+55        0.0000      0.00  Q          |          |          |          |
 10+ 0        0.0000      0.00  Q          |          |          |          |
 10+ 5        0.0000      0.00  Q          |          |          |          |
 10+10        0.0000      0.00  Q          |          |          |          |
 10+15        0.0000      0.00  Q          |          |          |          |
 10+20        0.0000      0.00  Q          |          |          |          |
 10+25        0.0000      0.00  Q          |          |          |          |
 10+30        0.0000      0.00  Q          |          |          |          |
 10+35        0.0000      0.00  Q          |          |          |          |
 10+40        0.0000      0.00  Q          |          |          |          |
```

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10+45       0.0000      0.00  Q         |         |         |         |
10+50       0.0000      0.00  Q         |         |         |         |
10+55       0.0000      0.00  Q         |         |         |         |
11+ 0       0.0000      0.00  Q         |         |         |         |
11+ 5       0.0000      0.00  Q         |         |         |         |
11+10       0.0000      0.00  Q         |         |         |         |
11+15       0.0000      0.00  Q         |         |         |         |
11+20       0.0000      0.00  Q         |         |         |         |
11+25       0.0000      0.00  Q         |         |         |         |
11+30       0.0000      0.00  Q         |         |         |         |
11+35       0.0000      0.00  Q         |         |         |         |
11+40       0.0000      0.00  Q         |         |         |         |
11+45       0.0000      0.00  Q         |         |         |         |
11+50       0.0000      0.00  Q         |         |         |         |
11+55       0.0000      0.00  Q         |         |         |         |
12+ 0       0.0000      0.00  Q         |         |         |         |
12+ 5       0.0000      0.00  Q         |         |         |         |
12+10       0.0000      0.00  Q         |         |         |         |
12+15       0.0000      0.00  Q         |         |         |         |
12+20       0.0000      0.00  Q         |         |         |         |
12+25       0.0000      0.00  Q         |         |         |         |
12+30       0.0000      0.00  Q         |         |         |         |
12+35       0.0000      0.00  Q         |         |         |         |
12+40       0.0000      0.00  Q         |         |         |         |
12+45       0.0000      0.00  Q         |         |         |         |
12+50       0.0000      0.00  Q         |         |         |         |
12+55       0.0000      0.00  Q         |         |         |         |
13+ 0       0.0000      0.00  Q         |         |         |         |
13+ 5       0.0000      0.00  Q         |         |         |         |
13+10       0.0000      0.00  Q         |         |         |         |
13+15       0.0000      0.00  Q         |         |         |         |
13+20       0.0000      0.00  Q         |         |         |         |
13+25       0.0000      0.00  Q         |         |         |         |
13+30       0.0000      0.00  Q         |         |         |         |
13+35       0.0000      0.00  Q         |         |         |         |
13+40       0.0000      0.00  Q         |         |         |         |
13+45       0.0000      0.00  Q         |         |         |         |
13+50       0.0000      0.00  Q         |         |         |         |
13+55       0.0000      0.00  Q         |         |         |         |
14+ 0       0.0000      0.00  Q         |         |         |         |
14+ 5       0.0000      0.00  Q         |         |         |         |
14+10       0.0000      0.00  Q         |         |         |         |
14+15       0.0000      0.00  Q         |         |         |         |
14+20       0.0000      0.00  Q         |         |         |         |
14+25       0.0000      0.00  Q         |         |         |         |
14+30       0.0000      0.00  Q         |         |         |         |
14+35       0.0000      0.00  Q         |         |         |         |
14+40       0.0000      0.00  Q         |         |         |         |
14+45       0.0000      0.00  Q         |         |         |         |
14+50       0.0000      0.00  Q         |         |         |         |
14+55       0.0000      0.00  Q         |         |         |         |
15+ 0       0.0000      0.00  Q         |         |         |         |
15+ 5       0.0000      0.00  Q         |         |         |         |
15+10       0.0000      0.00  Q         |         |         |         |
15+15       0.0000      0.00  Q         |         |         |         |
15+20       0.0000      0.00  Q         |         |         |         |
15+25       0.0000      0.00  Q         |         |         |         |
15+30       0.0000      0.00  Q         |         |         |         |
15+35       0.0000      0.00  Q         |         |         |         |
15+40       0.0000      0.00  Q         |         |         |         |
15+45       0.0000      0.00  Q         |         |         |         |
15+50       0.0000      0.00  Q         |         |         |         |
15+55       0.0000      0.00  Q         |         |         |         |
16+ 0       0.0000      0.00  Q         |         |         |         |
16+ 5       0.0013      0.19  Q         |         |         |         |
16+10       0.0054      0.59  | QV      |         |         |         |
16+15       0.0126      1.04  |   Q  V  |         |         |         |
16+20       0.0223      1.41  |    Q    |   V     |         |         |
16+25       0.0322      1.43  |    Q    |         V         |         |
16+30       0.0391      1.01  |   Q     |         |   V     |         |
16+35       0.0436      0.65  | Q       |         |      V  |         |
16+40       0.0466      0.44  |Q        |         |        V|         |
16+45       0.0488      0.32  |Q        |         |         V         |
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16+50       0.0507      0.27  |Q        |         |         |V        |
16+55       0.0523      0.23  Q         |         |         | V       |
17+ 0       0.0536      0.20  Q         |         |         |  V      |
17+ 5       0.0548      0.17  Q         |         |         |   V     |
17+10       0.0558      0.14  Q         |         |         |    V    |
17+15       0.0567      0.13  Q         |         |         |    V    |
17+20       0.0575      0.12  Q         |         |         |     V   |
17+25       0.0581      0.10  Q         |         |         |     V   |
17+30       0.0588      0.09  Q         |         |         |      V  |
17+35       0.0593      0.07  Q         |         |         |      V  |
17+40       0.0597      0.07  Q         |         |         |      V  |
17+45       0.0602      0.06  Q         |         |         |      V  |
17+50       0.0606      0.06  Q         |         |         |       V |
17+55       0.0610      0.06  Q         |         |         |       V |
18+ 0       0.0613      0.05  Q         |         |         |       V |
18+ 5       0.0616      0.04  Q         |         |         |       V |
18+10       0.0619      0.04  Q         |         |         |       V |
18+15       0.0621      0.04  Q         |         |         |        V|
18+20       0.0623      0.03  Q         |         |         |        V|
18+25       0.0625      0.03  Q         |         |         |        V|
18+30       0.0627      0.02  Q         |         |         |        V|
18+35       0.0628      0.02  Q         |         |         |        V|
18+40       0.0630      0.02  Q         |         |         |        V|
18+45       0.0631      0.02  Q         |         |         |        V|
18+50       0.0632      0.02  Q         |         |         |        V|
18+55       0.0634      0.02  Q         |         |         |        V|
19+ 0       0.0635      0.02  Q         |         |         |         V
19+ 5       0.0635      0.00  Q         |         |         |         V
19+10       0.0635      0.00  Q         |         |         |         V
19+15       0.0635      0.00  Q         |         |         |         V
19+20       0.0635      0.00  Q         |         |         |         V
19+25       0.0635      0.00  Q         |         |         |         V
19+30       0.0635      0.00  Q         |         |         |         V
19+35       0.0635      0.00  Q         |         |         |         V
19+40       0.0635      0.00  Q         |         |         |         V
19+45       0.0635      0.00  Q         |         |         |         V
19+50       0.0635      0.00  Q         |         |         |         V
19+55       0.0635      0.00  Q         |         |         |         V
20+ 0       0.0635      0.00  Q         |         |         |         V
20+ 5       0.0635      0.00  Q         |         |         |         V
20+10       0.0635      0.00  Q         |         |         |         V
20+15       0.0635      0.00  Q         |         |         |         V
20+20       0.0635      0.00  Q         |         |         |         V
20+25       0.0635      0.00  Q         |         |         |         V
20+30       0.0635      0.00  Q         |         |         |         V
20+35       0.0635      0.00  Q         |         |         |         V
20+40       0.0635      0.00  Q         |         |         |         V
20+45       0.0635      0.00  Q         |         |         |         V
20+50       0.0635      0.00  Q         |         |         |         V
20+55       0.0635      0.00  Q         |         |         |         V
21+ 0       0.0635      0.00  Q         |         |         |         V
21+ 5       0.0635      0.00  Q         |         |         |         V
21+10       0.0635      0.00  Q         |         |         |         V
21+15       0.0635      0.00  Q         |         |         |         V
21+20       0.0635      0.00  Q         |         |         |         V
21+25       0.0635      0.00  Q         |         |         |         V
21+30       0.0635      0.00  Q         |         |         |         V
21+35       0.0635      0.00  Q         |         |         |         V
21+40       0.0635      0.00  Q         |         |         |         V
21+45       0.0635      0.00  Q         |         |         |         V
21+50       0.0635      0.00  Q         |         |         |         V
21+55       0.0635      0.00  Q         |         |         |         V
22+ 0       0.0635      0.00  Q         |         |         |         V
22+ 5       0.0635      0.00  Q         |         |         |         V
22+10       0.0635      0.00  Q         |         |         |         V
22+15       0.0635      0.00  Q         |         |         |         V
22+20       0.0635      0.00  Q         |         |         |         V
22+25       0.0635      0.00  Q         |         |         |         V
22+30       0.0635      0.00  Q         |         |         |         V
22+35       0.0635      0.00  Q         |         |         |         V
22+40       0.0635      0.00  Q         |         |         |         V
22+45       0.0635      0.00  Q         |         |         |         V
22+50       0.0635      0.00  Q         |         |         |         V
```

```
   22+55       0.0635      0.00  Q         |         |         |         V
   23+ 0       0.0635      0.00  Q         |         |         |         V
   23+ 5       0.0635      0.00  Q         |         |         |         V
   23+10       0.0635      0.00  Q         |         |         |         V
   23+15       0.0635      0.00  Q         |         |         |         V
   23+20       0.0635      0.00  Q         |         |         |         V
   23+25       0.0635      0.00  Q         |         |         |         V
   23+30       0.0635      0.00  Q         |         |         |         V
   23+35       0.0635      0.00  Q         |         |         |         V
   23+40       0.0635      0.00  Q         |         |         |         V
   23+45       0.0635      0.00  Q         |         |         |         V
   23+50       0.0635      0.00  Q         |         |         |         V
   23+55       0.0635      0.00  Q         |         |         |         V
   24+ 0       0.0635      0.00  Q         |         |         |         V
   24+ 5       0.0635      0.00  Q         |         |         |         V
   24+10       0.0635      0.00  Q         |         |         |         V
   24+15       0.0635      0.00  Q         |         |         |         V
   24+20       0.0635      0.00  Q         |         |         |         V
   24+25       0.0635      0.00  Q         |         |         |         V
   24+30       0.0635      0.00  Q         |         |         |         V
   24+35       0.0635      0.00  Q         |         |         |         V
   24+40       0.0635      0.00  Q         |         |         |         V
   24+45       0.0635      0.00  Q         |         |         |         V
   24+50       0.0635      0.00  Q         |         |         |         V
   24+55       0.0635      0.00  Q         |         |         |         V
   25+ 0       0.0635      0.00  Q         |         |         |         V
   25+ 5       0.0635      0.00  Q         |         |         |         V
   25+10       0.0635      0.00  Q         |         |         |         V
   25+15       0.0635      0.00  Q         |         |         |         V
   25+20       0.0635      0.00  Q         |         |         |         V
   25+25       0.0635      0.00  Q         |         |         |         V
   25+30       0.0635      0.00  Q         |         |         |         V
   25+35       0.0635      0.00  Q         |         |         |         V
   25+40       0.0635      0.00  Q         |         |         |         V
   25+45       0.0635      0.00  Q         |         |         |         V
   25+50       0.0635      0.00  Q         |         |         |         V
   25+55       0.0635      0.00  Q         |         |         |         V
   26+ 0       0.0635      0.00  Q         |         |         |         V
   26+ 5       0.0635      0.00  Q         |         |         |         V
   26+10       0.0635      0.00  Q         |         |         |         V
   26+15       0.0635      0.00  Q         |         |         |         V
   26+20       0.0635      0.00  Q         |         |         |         V
   26+25       0.0635      0.00  Q         |         |         |         V
   26+30       0.0635      0.00  Q         |         |         |         V
   26+35       0.0635      0.00  Q         |         |         |         V
   26+40       0.0635      0.00  Q         |         |         |         V
   26+45       0.0635      0.00  Q         |         |         |         V
   26+50       0.0635      0.00  Q         |         |         |         V
   26+55       0.0635      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

        Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018, Version 9.0

                Study date  03/22/21


+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
-------------------------------------------------------------------------

San Bernardino County Synthetic Unit Hydrology Method
                Manual date - August 1986


Program License Serial Number 6320

----------------------------------------------------------------------
204828 - TEC EQUIPMENT 776 MILL ST
EXISITNG CONDITIONS
5-YEAR, 24-HOUR STORM
BY: JTS  DATE: 03-22-21
---------------------------------------------------------------------

        Storm Event Year = 5

        Antecedent Moisture Condition = 1

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format




Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 10
             7.01           1           0.83
---------------------------------------------------------------------
Rainfall data for year 2
             7.01           6           1.41
---------------------------------------------------------------------
Rainfall data for year 2
             7.01          24           2.40
---------------------------------------------------------------------
Rainfall data for year 100
             7.01           1           1.28
---------------------------------------------------------------------
Rainfall data for year 100
             7.01           6           2.60
---------------------------------------------------------------------
Rainfall data for year 100
             7.01          24           5.90
---------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 1)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 50.0      31.0          7.01      1.000     0.983    1.000    0.983

Area-averaged adjusted loss rate Fm (In/Hr) =  0.983

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC1)           Yield Fr
```

```
     7.01   1.000         50.0      31.0      16.10     0.000

Area-averaged catchment yield fraction, Y =  0.000
Area-averaged low loss fraction, Yb =  1.000
User entry of time of concentration  =   0.460 (hours)
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       7.01(Ac.)
Catchment Lag time =   0.368 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 22.6449
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.983(In/Hr)
Average low loss rate fraction (Yb) = 1.000 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.257(In)
Computed peak 30-minute rainfall =  0.526(In)
Specified peak 1-hour rainfall =  0.695(In)
Computed peak 3-hour rainfall =  1.198(In)
Specified peak 6-hour rainfall =  1.689(In)
Specified peak 24-hour rainfall =  3.220(In)


Rainfall depth area reduction factors:
Using a total area of       7.01(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.257(In)
30-minute factor = 1.000    Adjusted rainfall =  0.526(In)
1-hour factor = 1.000       Adjusted rainfall =  0.694(In)
3-hour factor = 1.000       Adjusted rainfall =  1.197(In)
6-hour factor = 1.000       Adjusted rainfall =  1.689(In)
24-hour factor = 1.000      Adjusted rainfall =  3.220(In)
---------------------------------------------------------------------

                        U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph         Unit Hydrograph
Number            Mean values            ((CFS))
---------------------------------------------------------------------
                (K =       84.78 (CFS))

  1                2.049                   1.737
  2                8.477                   5.450
  3               19.785                   9.587
  4               35.087                  12.972
  5               50.623                  13.171
  6               61.571                   9.282
  7               68.622                   5.977
  8               73.370                   4.025
  9               76.878                   2.974
 10               79.814                   2.489
 11               82.277                   2.088
 12               84.416                   1.814
 13               86.277                   1.577
 14               87.834                   1.320
 15               89.201                   1.159
 16               90.506                   1.106
 17               91.540                   0.877
 18               92.521                   0.832
 19               93.306                   0.665
 20               94.030                   0.614
 21               94.727                   0.591
 22               95.406                   0.576
 23               96.009                   0.511
 24               96.507                   0.423
 25               96.983                   0.403
 26               97.394                   0.349
 27               97.790                   0.336
 28               98.118                   0.278
 29               98.431                   0.265
 30               98.680                   0.211
 31               98.907                   0.192
 32               99.133                   0.192
 33               99.360                   0.192
```

```
 34               99.586                   0.192
 35               99.812                   0.192
 36              100.000                   0.159
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number              (In)                (In)
  1              0.2570               0.2570
  2              0.3391               0.0821
  3              0.3988               0.0597
  4              0.4474               0.0486
  5              0.4892               0.0418
  6              0.5262               0.0370
  7              0.5597               0.0335
  8              0.5904               0.0307
  9              0.6188               0.0285
 10              0.6455               0.0266
 11              0.6706               0.0251
 12              0.6943               0.0237
 13              0.7224               0.0281
 14              0.7495               0.0271
 15              0.7756               0.0261
 16              0.8008               0.0252
 17              0.8253               0.0245
 18              0.8490               0.0237
 19              0.8721               0.0231
 20              0.8946               0.0225
 21              0.9165               0.0219
 22              0.9379               0.0214
 23              0.9588               0.0209
 24              0.9793               0.0205
 25              0.9993               0.0200
 26              1.0189               0.0196
 27              1.0382               0.0193
 28              1.0571               0.0189
 29              1.0757               0.0186
 30              1.0939               0.0182
 31              1.1119               0.0179
 32              1.1295               0.0177
 33              1.1469               0.0174
 34              1.1640               0.0171
 35              1.1809               0.0169
 36              1.1975               0.0166
 37              1.2139               0.0164
 38              1.2300               0.0162
 39              1.2460               0.0159
 40              1.2617               0.0157
 41              1.2773               0.0155
 42              1.2926               0.0154
 43              1.3078               0.0152
 44              1.3228               0.0150
 45              1.3376               0.0148
 46              1.3523               0.0147
 47              1.3668               0.0145
 48              1.3811               0.0143
 49              1.3953               0.0142
 50              1.4093               0.0140
 51              1.4233               0.0139
 52              1.4370               0.0138
 53              1.4507               0.0136
 54              1.4642               0.0135
 55              1.4776               0.0134
 56              1.4908               0.0133
 57              1.5040               0.0131
 58              1.5170               0.0130
 59              1.5299               0.0129
 60              1.5427               0.0128
 61              1.5554               0.0127
 62              1.5680               0.0126
 63              1.5805               0.0125
 64              1.5929               0.0124
 65              1.6052               0.0123
 66              1.6174               0.0122
 67              1.6295               0.0121
```

68	1.6415	0.0120
69	1.6534	0.0119
70	1.6653	0.0118
71	1.6770	0.0118
72	1.6887	0.0117
73	1.6996	0.0109
74	1.7104	0.0108
75	1.7211	0.0107
76	1.7317	0.0106
77	1.7423	0.0106
78	1.7528	0.0105
79	1.7632	0.0104
80	1.7736	0.0104
81	1.7839	0.0103
82	1.7941	0.0102
83	1.8042	0.0102
84	1.8143	0.0101
85	1.8243	0.0100
86	1.8343	0.0100
87	1.8442	0.0099
88	1.8540	0.0098
89	1.8638	0.0098
90	1.8735	0.0097
91	1.8832	0.0097
92	1.8928	0.0096
93	1.9024	0.0096
94	1.9119	0.0095
95	1.9213	0.0094
96	1.9307	0.0094
97	1.9400	0.0093
98	1.9493	0.0093
99	1.9585	0.0092
100	1.9677	0.0092
101	1.9769	0.0091
102	1.9860	0.0091
103	1.9950	0.0090
104	2.0040	0.0090
105	2.0129	0.0089
106	2.0218	0.0089
107	2.0307	0.0089
108	2.0395	0.0088
109	2.0483	0.0088
110	2.0570	0.0087
111	2.0657	0.0087
112	2.0743	0.0086
113	2.0829	0.0086
114	2.0915	0.0086
115	2.1000	0.0085
116	2.1085	0.0085
117	2.1169	0.0084
118	2.1253	0.0084
119	2.1337	0.0084
120	2.1420	0.0083
121	2.1503	0.0083
122	2.1586	0.0083
123	2.1668	0.0082
124	2.1750	0.0082
125	2.1831	0.0081
126	2.1912	0.0081
127	2.1993	0.0081
128	2.2074	0.0080
129	2.2154	0.0080
130	2.2234	0.0080
131	2.2313	0.0079
132	2.2392	0.0079
133	2.2471	0.0079
134	2.2549	0.0078
135	2.2628	0.0078
136	2.2705	0.0078
137	2.2783	0.0078
138	2.2860	0.0077
139	2.2937	0.0077
140	2.3014	0.0077

141	2.3090	0.0076
142	2.3166	0.0076
143	2.3242	0.0076
144	2.3318	0.0076
145	2.3393	0.0075
146	2.3468	0.0075
147	2.3543	0.0075
148	2.3617	0.0074
149	2.3691	0.0074
150	2.3765	0.0074
151	2.3839	0.0074
152	2.3912	0.0073
153	2.3985	0.0073
154	2.4058	0.0073
155	2.4131	0.0073
156	2.4203	0.0072
157	2.4275	0.0072
158	2.4347	0.0072
159	2.4419	0.0072
160	2.4490	0.0071
161	2.4561	0.0071
162	2.4632	0.0071
163	2.4703	0.0071
164	2.4773	0.0070
165	2.4843	0.0070
166	2.4913	0.0070
167	2.4983	0.0070
168	2.5053	0.0070
169	2.5122	0.0069
170	2.5191	0.0069
171	2.5260	0.0069
172	2.5328	0.0069
173	2.5397	0.0068
174	2.5465	0.0068
175	2.5533	0.0068
176	2.5601	0.0068
177	2.5669	0.0068
178	2.5736	0.0067
179	2.5803	0.0067
180	2.5870	0.0067
181	2.5937	0.0067
182	2.6004	0.0067
183	2.6070	0.0066
184	2.6136	0.0066
185	2.6202	0.0066
186	2.6268	0.0066
187	2.6334	0.0066
188	2.6399	0.0065
189	2.6465	0.0065
190	2.6530	0.0065
191	2.6595	0.0065
192	2.6659	0.0065
193	2.6724	0.0065
194	2.6788	0.0064
195	2.6852	0.0064
196	2.6916	0.0064
197	2.6980	0.0064
198	2.7044	0.0064
199	2.7107	0.0063
200	2.7171	0.0063
201	2.7234	0.0063
202	2.7297	0.0063
203	2.7360	0.0063
204	2.7422	0.0063
205	2.7485	0.0062
206	2.7547	0.0062
207	2.7609	0.0062
208	2.7671	0.0062
209	2.7733	0.0062
210	2.7795	0.0062
211	2.7856	0.0062
212	2.7918	0.0061
213	2.7979	0.0061

214	2.8040	0.0061
215	2.8101	0.0061
216	2.8162	0.0061
217	2.8222	0.0061
218	2.8283	0.0060
219	2.8343	0.0060
220	2.8403	0.0060
221	2.8463	0.0060
222	2.8523	0.0060
223	2.8583	0.0060
224	2.8643	0.0060
225	2.8702	0.0059
226	2.8761	0.0059
227	2.8821	0.0059
228	2.8880	0.0059
229	2.8939	0.0059
230	2.8997	0.0059
231	2.9056	0.0059
232	2.9114	0.0058
233	2.9173	0.0058
234	2.9231	0.0058
235	2.9289	0.0058
236	2.9347	0.0058
237	2.9405	0.0058
238	2.9463	0.0058
239	2.9520	0.0058
240	2.9578	0.0057
241	2.9635	0.0057
242	2.9692	0.0057
243	2.9749	0.0057
244	2.9806	0.0057
245	2.9863	0.0057
246	2.9920	0.0057
247	2.9976	0.0057
248	3.0033	0.0056
249	3.0089	0.0056
250	3.0145	0.0056
251	3.0201	0.0056
252	3.0257	0.0056
253	3.0313	0.0056
254	3.0369	0.0056
255	3.0424	0.0056
256	3.0480	0.0055
257	3.0535	0.0055
258	3.0590	0.0055
259	3.0645	0.0055
260	3.0700	0.0055
261	3.0755	0.0055
262	3.0810	0.0055
263	3.0865	0.0055
264	3.0919	0.0055
265	3.0974	0.0054
266	3.1028	0.0054
267	3.1083	0.0054
268	3.1137	0.0054
269	3.1191	0.0054
270	3.1245	0.0054
271	3.1298	0.0054
272	3.1352	0.0054
273	3.1406	0.0054
274	3.1459	0.0054
275	3.1513	0.0053
276	3.1566	0.0053
277	3.1619	0.0053
278	3.1672	0.0053
279	3.1725	0.0053
280	3.1778	0.0053
281	3.1831	0.0053
282	3.1884	0.0053
283	3.1936	0.0053
284	3.1989	0.0052
285	3.2041	0.0052
286	3.2093	0.0052

```
287               3.2145               0.0052
288               3.2198               0.0052
----------------------------------------------------------------------
Unit               Unit              Unit               Effective
Period             Rainfall          Soil-Loss          Rainfall
(number)             (In)            (In)                 (In)
----------------------------------------------------------------------
  1               0.0052           0.0052               0.0000
  2               0.0052           0.0052               0.0000
  3               0.0052           0.0052               0.0000
  4               0.0052           0.0052               0.0000
  5               0.0053           0.0053               0.0000
  6               0.0053           0.0053               0.0000
  7               0.0053           0.0053               0.0000
  8               0.0053           0.0053               0.0000
  9               0.0053           0.0053               0.0000
 10               0.0053           0.0053               0.0000
 11               0.0054           0.0054               0.0000
 12               0.0054           0.0054               0.0000
 13               0.0054           0.0054               0.0000
 14               0.0054           0.0054               0.0000
 15               0.0054           0.0054               0.0000
 16               0.0054           0.0054               0.0000
 17               0.0055           0.0055               0.0000
 18               0.0055           0.0055               0.0000
 19               0.0055           0.0055               0.0000
 20               0.0055           0.0055               0.0000
 21               0.0055           0.0055               0.0000
 22               0.0055           0.0055               0.0000
 23               0.0056           0.0056               0.0000
 24               0.0056           0.0056               0.0000
 25               0.0056           0.0056               0.0000
 26               0.0056           0.0056               0.0000
 27               0.0056           0.0056               0.0000
 28               0.0056           0.0056               0.0000
 29               0.0057           0.0057               0.0000
 30               0.0057           0.0057               0.0000
 31               0.0057           0.0057               0.0000
 32               0.0057           0.0057               0.0000
 33               0.0057           0.0057               0.0000
 34               0.0058           0.0058               0.0000
 35               0.0058           0.0058               0.0000
 36               0.0058           0.0058               0.0000
 37               0.0058           0.0058               0.0000
 38               0.0058           0.0058               0.0000
 39               0.0059           0.0059               0.0000
 40               0.0059           0.0059               0.0000
 41               0.0059           0.0059               0.0000
 42               0.0059           0.0059               0.0000
 43               0.0059           0.0059               0.0000
 44               0.0060           0.0060               0.0000
 45               0.0060           0.0060               0.0000
 46               0.0060           0.0060               0.0000
 47               0.0060           0.0060               0.0000
 48               0.0060           0.0060               0.0000
 49               0.0061           0.0061               0.0000
 50               0.0061           0.0061               0.0000
 51               0.0061           0.0061               0.0000
 52               0.0061           0.0061               0.0000
 53               0.0062           0.0062               0.0000
 54               0.0062           0.0062               0.0000
 55               0.0062           0.0062               0.0000
 56               0.0062           0.0062               0.0000
 57               0.0063           0.0063               0.0000
 58               0.0063           0.0063               0.0000
 59               0.0063           0.0063               0.0000
 60               0.0063           0.0063               0.0000
 61               0.0064           0.0064               0.0000
 62               0.0064           0.0064               0.0000
 63               0.0064           0.0064               0.0000
 64               0.0064           0.0064               0.0000
 65               0.0065           0.0065               0.0000
 66               0.0065           0.0065               0.0000
```

67	0.0065	0.0065	0.0000
68	0.0065	0.0065	0.0000
69	0.0066	0.0066	0.0000
70	0.0066	0.0066	0.0000
71	0.0066	0.0066	0.0000
72	0.0067	0.0067	0.0000
73	0.0067	0.0067	0.0000
74	0.0067	0.0067	0.0000
75	0.0068	0.0068	0.0000
76	0.0068	0.0068	0.0000
77	0.0068	0.0068	0.0000
78	0.0068	0.0068	0.0000
79	0.0069	0.0069	0.0000
80	0.0069	0.0069	0.0000
81	0.0070	0.0070	0.0000
82	0.0070	0.0070	0.0000
83	0.0070	0.0070	0.0000
84	0.0070	0.0070	0.0000
85	0.0071	0.0071	0.0000
86	0.0071	0.0071	0.0000
87	0.0072	0.0072	0.0000
88	0.0072	0.0072	0.0000
89	0.0072	0.0072	0.0000
90	0.0073	0.0073	0.0000
91	0.0073	0.0073	0.0000
92	0.0073	0.0073	0.0000
93	0.0074	0.0074	0.0000
94	0.0074	0.0074	0.0000
95	0.0075	0.0075	0.0000
96	0.0075	0.0075	0.0000
97	0.0076	0.0076	0.0000
98	0.0076	0.0076	0.0000
99	0.0076	0.0076	0.0000
100	0.0077	0.0077	0.0000
101	0.0077	0.0077	0.0000
102	0.0078	0.0078	0.0000
103	0.0078	0.0078	0.0000
104	0.0078	0.0078	0.0000
105	0.0079	0.0079	0.0000
106	0.0079	0.0079	0.0000
107	0.0080	0.0080	0.0000
108	0.0080	0.0080	0.0000
109	0.0081	0.0081	0.0000
110	0.0081	0.0081	0.0000
111	0.0082	0.0082	0.0000
112	0.0083	0.0083	0.0000
113	0.0083	0.0083	0.0000
114	0.0084	0.0084	0.0000
115	0.0084	0.0084	0.0000
116	0.0085	0.0085	0.0000
117	0.0086	0.0086	0.0000
118	0.0086	0.0086	0.0000
119	0.0087	0.0087	0.0000
120	0.0087	0.0087	0.0000
121	0.0088	0.0088	0.0000
122	0.0089	0.0089	0.0000
123	0.0089	0.0089	0.0000
124	0.0090	0.0090	0.0000
125	0.0091	0.0091	0.0000
126	0.0091	0.0091	0.0000
127	0.0092	0.0092	0.0000
128	0.0093	0.0093	0.0000
129	0.0094	0.0094	0.0000
130	0.0094	0.0094	0.0000
131	0.0096	0.0096	0.0000
132	0.0096	0.0096	0.0000
133	0.0097	0.0097	0.0000
134	0.0098	0.0098	0.0000
135	0.0099	0.0099	0.0000
136	0.0100	0.0100	0.0000
137	0.0101	0.0101	0.0000
138	0.0102	0.0102	0.0000
139	0.0103	0.0103	0.0000

140	0.0104	0.0104	0.0000
141	0.0105	0.0105	0.0000
142	0.0106	0.0106	0.0000
143	0.0107	0.0107	0.0000
144	0.0108	0.0108	0.0000
145	0.0117	0.0117	0.0000
146	0.0118	0.0118	0.0000
147	0.0119	0.0119	0.0000
148	0.0120	0.0120	0.0000
149	0.0122	0.0122	0.0000
150	0.0123	0.0123	0.0000
151	0.0125	0.0125	0.0000
152	0.0126	0.0126	0.0000
153	0.0128	0.0128	0.0000
154	0.0129	0.0129	0.0000
155	0.0131	0.0131	0.0000
156	0.0133	0.0133	0.0000
157	0.0135	0.0135	0.0000
158	0.0136	0.0136	0.0000
159	0.0139	0.0139	0.0000
160	0.0140	0.0140	0.0000
161	0.0143	0.0143	0.0000
162	0.0145	0.0145	0.0000
163	0.0148	0.0148	0.0000
164	0.0150	0.0150	0.0000
165	0.0154	0.0154	0.0000
166	0.0155	0.0155	0.0000
167	0.0159	0.0159	0.0000
168	0.0162	0.0162	0.0000
169	0.0166	0.0166	0.0000
170	0.0169	0.0169	0.0000
171	0.0174	0.0174	0.0000
172	0.0177	0.0177	0.0000
173	0.0182	0.0182	0.0000
174	0.0186	0.0186	0.0000
175	0.0193	0.0193	0.0000
176	0.0196	0.0196	0.0000
177	0.0205	0.0205	0.0000
178	0.0209	0.0209	0.0000
179	0.0219	0.0219	0.0000
180	0.0225	0.0225	0.0000
181	0.0237	0.0237	0.0000
182	0.0245	0.0245	0.0000
183	0.0261	0.0261	0.0000
184	0.0271	0.0271	0.0000
185	0.0237	0.0237	0.0000
186	0.0251	0.0251	0.0000
187	0.0285	0.0285	0.0000
188	0.0307	0.0307	0.0000
189	0.0370	0.0370	0.0000
190	0.0418	0.0418	0.0000
191	0.0597	0.0597	0.0000
192	0.0821	0.0819	0.0002
193	0.2570	0.0819	0.1750
194	0.0486	0.0486	0.0000
195	0.0335	0.0335	0.0000
196	0.0266	0.0266	0.0000
197	0.0281	0.0281	0.0000
198	0.0252	0.0252	0.0000
199	0.0231	0.0231	0.0000
200	0.0214	0.0214	0.0000
201	0.0200	0.0200	0.0000
202	0.0189	0.0189	0.0000
203	0.0179	0.0179	0.0000
204	0.0171	0.0171	0.0000
205	0.0164	0.0164	0.0000
206	0.0157	0.0157	0.0000
207	0.0152	0.0152	0.0000
208	0.0147	0.0147	0.0000
209	0.0142	0.0142	0.0000
210	0.0138	0.0138	0.0000
211	0.0134	0.0134	0.0000
212	0.0130	0.0130	0.0000

213	0.0127	0.0127	0.0000
214	0.0124	0.0124	0.0000
215	0.0121	0.0121	0.0000
216	0.0118	0.0118	0.0000
217	0.0109	0.0109	0.0000
218	0.0106	0.0106	0.0000
219	0.0104	0.0104	0.0000
220	0.0102	0.0102	0.0000
221	0.0100	0.0100	0.0000
222	0.0098	0.0098	0.0000
223	0.0097	0.0097	0.0000
224	0.0095	0.0095	0.0000
225	0.0093	0.0093	0.0000
226	0.0092	0.0092	0.0000
227	0.0090	0.0090	0.0000
228	0.0089	0.0089	0.0000
229	0.0088	0.0088	0.0000
230	0.0086	0.0086	0.0000
231	0.0085	0.0085	0.0000
232	0.0084	0.0084	0.0000
233	0.0083	0.0083	0.0000
234	0.0082	0.0082	0.0000
235	0.0081	0.0081	0.0000
236	0.0080	0.0080	0.0000
237	0.0079	0.0079	0.0000
238	0.0078	0.0078	0.0000
239	0.0077	0.0077	0.0000
240	0.0076	0.0076	0.0000
241	0.0075	0.0075	0.0000
242	0.0074	0.0074	0.0000
243	0.0074	0.0074	0.0000
244	0.0073	0.0073	0.0000
245	0.0072	0.0072	0.0000
246	0.0071	0.0071	0.0000
247	0.0071	0.0071	0.0000
248	0.0070	0.0070	0.0000
249	0.0069	0.0069	0.0000
250	0.0069	0.0069	0.0000
251	0.0068	0.0068	0.0000
252	0.0067	0.0067	0.0000
253	0.0067	0.0067	0.0000
254	0.0066	0.0066	0.0000
255	0.0066	0.0066	0.0000
256	0.0065	0.0065	0.0000
257	0.0065	0.0065	0.0000
258	0.0064	0.0064	0.0000
259	0.0063	0.0063	0.0000
260	0.0063	0.0063	0.0000
261	0.0062	0.0062	0.0000
262	0.0062	0.0062	0.0000
263	0.0062	0.0062	0.0000
264	0.0061	0.0061	0.0000
265	0.0061	0.0061	0.0000
266	0.0060	0.0060	0.0000
267	0.0060	0.0060	0.0000
268	0.0059	0.0059	0.0000
269	0.0059	0.0059	0.0000
270	0.0058	0.0058	0.0000
271	0.0058	0.0058	0.0000
272	0.0058	0.0058	0.0000
273	0.0057	0.0057	0.0000
274	0.0057	0.0057	0.0000
275	0.0057	0.0057	0.0000
276	0.0056	0.0056	0.0000
277	0.0056	0.0056	0.0000
278	0.0055	0.0055	0.0000
279	0.0055	0.0055	0.0000
280	0.0055	0.0055	0.0000
281	0.0054	0.0054	0.0000
282	0.0054	0.0054	0.0000
283	0.0054	0.0054	0.0000
284	0.0054	0.0054	0.0000
285	0.0053	0.0053	0.0000

```
      286             0.0053          0.0053             0.0000
      287             0.0053          0.0053             0.0000
      288             0.0052          0.0052             0.0000
      --------------------------------------------------------------------
      --------------------------------------------------------------------
      Total soil rain loss =      3.04(In)
      Total effective rainfall =      0.18(In)
      Peak flow rate in flood hydrograph =      2.31(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
-----------------------------------------------------------------------
  0+ 5       0.0000      0.00  Q         |         |         |         |
  0+10       0.0000      0.00  Q         |         |         |         |
  0+15       0.0000      0.00  Q         |         |         |         |
  0+20       0.0000      0.00  Q         |         |         |         |
  0+25       0.0000      0.00  Q         |         |         |         |
  0+30       0.0000      0.00  Q         |         |         |         |
  0+35       0.0000      0.00  Q         |         |         |         |
  0+40       0.0000      0.00  Q         |         |         |         |
  0+45       0.0000      0.00  Q         |         |         |         |
  0+50       0.0000      0.00  Q         |         |         |         |
  0+55       0.0000      0.00  Q         |         |         |         |
  1+ 0       0.0000      0.00  Q         |         |         |         |
  1+ 5       0.0000      0.00  Q         |         |         |         |
  1+10       0.0000      0.00  Q         |         |         |         |
  1+15       0.0000      0.00  Q         |         |         |         |
  1+20       0.0000      0.00  Q         |         |         |         |
  1+25       0.0000      0.00  Q         |         |         |         |
  1+30       0.0000      0.00  Q         |         |         |         |
  1+35       0.0000      0.00  Q         |         |         |         |
  1+40       0.0000      0.00  Q         |         |         |         |
  1+45       0.0000      0.00  Q         |         |         |         |
  1+50       0.0000      0.00  Q         |         |         |         |
  1+55       0.0000      0.00  Q         |         |         |         |
  2+ 0       0.0000      0.00  Q         |         |         |         |
  2+ 5       0.0000      0.00  Q         |         |         |         |
  2+10       0.0000      0.00  Q         |         |         |         |
  2+15       0.0000      0.00  Q         |         |         |         |
  2+20       0.0000      0.00  Q         |         |         |         |
  2+25       0.0000      0.00  Q         |         |         |         |
  2+30       0.0000      0.00  Q         |         |         |         |
  2+35       0.0000      0.00  Q         |         |         |         |
  2+40       0.0000      0.00  Q         |         |         |         |
  2+45       0.0000      0.00  Q         |         |         |         |
  2+50       0.0000      0.00  Q         |         |         |         |
  2+55       0.0000      0.00  Q         |         |         |         |
  3+ 0       0.0000      0.00  Q         |         |         |         |
  3+ 5       0.0000      0.00  Q         |         |         |         |
  3+10       0.0000      0.00  Q         |         |         |         |
  3+15       0.0000      0.00  Q         |         |         |         |
  3+20       0.0000      0.00  Q         |         |         |         |
  3+25       0.0000      0.00  Q         |         |         |         |
  3+30       0.0000      0.00  Q         |         |         |         |
  3+35       0.0000      0.00  Q         |         |         |         |
  3+40       0.0000      0.00  Q         |         |         |         |
  3+45       0.0000      0.00  Q         |         |         |         |
  3+50       0.0000      0.00  Q         |         |         |         |
  3+55       0.0000      0.00  Q         |         |         |         |
  4+ 0       0.0000      0.00  Q         |         |         |         |
  4+ 5       0.0000      0.00  Q         |         |         |         |
  4+10       0.0000      0.00  Q         |         |         |         |
  4+15       0.0000      0.00  Q         |         |         |         |
  4+20       0.0000      0.00  Q         |         |         |         |
  4+25       0.0000      0.00  Q         |         |         |         |
  4+30       0.0000      0.00  Q         |         |         |         |
  4+35       0.0000      0.00  Q         |         |         |         |
```

```
  4+40      0.0000      0.00  Q          |          |          |          |
  4+45      0.0000      0.00  Q          |          |          |          |
  4+50      0.0000      0.00  Q          |          |          |          |
  4+55      0.0000      0.00  Q          |          |          |          |
  5+ 0      0.0000      0.00  Q          |          |          |          |
  5+ 5      0.0000      0.00  Q          |          |          |          |
  5+10      0.0000      0.00  Q          |          |          |          |
  5+15      0.0000      0.00  Q          |          |          |          |
  5+20      0.0000      0.00  Q          |          |          |          |
  5+25      0.0000      0.00  Q          |          |          |          |
  5+30      0.0000      0.00  Q          |          |          |          |
  5+35      0.0000      0.00  Q          |          |          |          |
  5+40      0.0000      0.00  Q          |          |          |          |
  5+45      0.0000      0.00  Q          |          |          |          |
  5+50      0.0000      0.00  Q          |          |          |          |
  5+55      0.0000      0.00  Q          |          |          |          |
  6+ 0      0.0000      0.00  Q          |          |          |          |
  6+ 5      0.0000      0.00  Q          |          |          |          |
  6+10      0.0000      0.00  Q          |          |          |          |
  6+15      0.0000      0.00  Q          |          |          |          |
  6+20      0.0000      0.00  Q          |          |          |          |
  6+25      0.0000      0.00  Q          |          |          |          |
  6+30      0.0000      0.00  Q          |          |          |          |
  6+35      0.0000      0.00  Q          |          |          |          |
  6+40      0.0000      0.00  Q          |          |          |          |
  6+45      0.0000      0.00  Q          |          |          |          |
  6+50      0.0000      0.00  Q          |          |          |          |
  6+55      0.0000      0.00  Q          |          |          |          |
  7+ 0      0.0000      0.00  Q          |          |          |          |
  7+ 5      0.0000      0.00  Q          |          |          |          |
  7+10      0.0000      0.00  Q          |          |          |          |
  7+15      0.0000      0.00  Q          |          |          |          |
  7+20      0.0000      0.00  Q          |          |          |          |
  7+25      0.0000      0.00  Q          |          |          |          |
  7+30      0.0000      0.00  Q          |          |          |          |
  7+35      0.0000      0.00  Q          |          |          |          |
  7+40      0.0000      0.00  Q          |          |          |          |
  7+45      0.0000      0.00  Q          |          |          |          |
  7+50      0.0000      0.00  Q          |          |          |          |
  7+55      0.0000      0.00  Q          |          |          |          |
  8+ 0      0.0000      0.00  Q          |          |          |          |
  8+ 5      0.0000      0.00  Q          |          |          |          |
  8+10      0.0000      0.00  Q          |          |          |          |
  8+15      0.0000      0.00  Q          |          |          |          |
  8+20      0.0000      0.00  Q          |          |          |          |
  8+25      0.0000      0.00  Q          |          |          |          |
  8+30      0.0000      0.00  Q          |          |          |          |
  8+35      0.0000      0.00  Q          |          |          |          |
  8+40      0.0000      0.00  Q          |          |          |          |
  8+45      0.0000      0.00  Q          |          |          |          |
  8+50      0.0000      0.00  Q          |          |          |          |
  8+55      0.0000      0.00  Q          |          |          |          |
  9+ 0      0.0000      0.00  Q          |          |          |          |
  9+ 5      0.0000      0.00  Q          |          |          |          |
  9+10      0.0000      0.00  Q          |          |          |          |
  9+15      0.0000      0.00  Q          |          |          |          |
  9+20      0.0000      0.00  Q          |          |          |          |
  9+25      0.0000      0.00  Q          |          |          |          |
  9+30      0.0000      0.00  Q          |          |          |          |
  9+35      0.0000      0.00  Q          |          |          |          |
  9+40      0.0000      0.00  Q          |          |          |          |
  9+45      0.0000      0.00  Q          |          |          |          |
  9+50      0.0000      0.00  Q          |          |          |          |
  9+55      0.0000      0.00  Q          |          |          |          |
 10+ 0      0.0000      0.00  Q          |          |          |          |
 10+ 5      0.0000      0.00  Q          |          |          |          |
 10+10      0.0000      0.00  Q          |          |          |          |
 10+15      0.0000      0.00  Q          |          |          |          |
 10+20      0.0000      0.00  Q          |          |          |          |
 10+25      0.0000      0.00  Q          |          |          |          |
 10+30      0.0000      0.00  Q          |          |          |          |
 10+35      0.0000      0.00  Q          |          |          |          |
 10+40      0.0000      0.00  Q          |          |          |          |
```

```
10+45       0.0000      0.00  Q         |         |         |         |
10+50       0.0000      0.00  Q         |         |         |         |
10+55       0.0000      0.00  Q         |         |         |         |
11+ 0       0.0000      0.00  Q         |         |         |         |
11+ 5       0.0000      0.00  Q         |         |         |         |
11+10       0.0000      0.00  Q         |         |         |         |
11+15       0.0000      0.00  Q         |         |         |         |
11+20       0.0000      0.00  Q         |         |         |         |
11+25       0.0000      0.00  Q         |         |         |         |
11+30       0.0000      0.00  Q         |         |         |         |
11+35       0.0000      0.00  Q         |         |         |         |
11+40       0.0000      0.00  Q         |         |         |         |
11+45       0.0000      0.00  Q         |         |         |         |
11+50       0.0000      0.00  Q         |         |         |         |
11+55       0.0000      0.00  Q         |         |         |         |
12+ 0       0.0000      0.00  Q         |         |         |         |
12+ 5       0.0000      0.00  Q         |         |         |         |
12+10       0.0000      0.00  Q         |         |         |         |
12+15       0.0000      0.00  Q         |         |         |         |
12+20       0.0000      0.00  Q         |         |         |         |
12+25       0.0000      0.00  Q         |         |         |         |
12+30       0.0000      0.00  Q         |         |         |         |
12+35       0.0000      0.00  Q         |         |         |         |
12+40       0.0000      0.00  Q         |         |         |         |
12+45       0.0000      0.00  Q         |         |         |         |
12+50       0.0000      0.00  Q         |         |         |         |
12+55       0.0000      0.00  Q         |         |         |         |
13+ 0       0.0000      0.00  Q         |         |         |         |
13+ 5       0.0000      0.00  Q         |         |         |         |
13+10       0.0000      0.00  Q         |         |         |         |
13+15       0.0000      0.00  Q         |         |         |         |
13+20       0.0000      0.00  Q         |         |         |         |
13+25       0.0000      0.00  Q         |         |         |         |
13+30       0.0000      0.00  Q         |         |         |         |
13+35       0.0000      0.00  Q         |         |         |         |
13+40       0.0000      0.00  Q         |         |         |         |
13+45       0.0000      0.00  Q         |         |         |         |
13+50       0.0000      0.00  Q         |         |         |         |
13+55       0.0000      0.00  Q         |         |         |         |
14+ 0       0.0000      0.00  Q         |         |         |         |
14+ 5       0.0000      0.00  Q         |         |         |         |
14+10       0.0000      0.00  Q         |         |         |         |
14+15       0.0000      0.00  Q         |         |         |         |
14+20       0.0000      0.00  Q         |         |         |         |
14+25       0.0000      0.00  Q         |         |         |         |
14+30       0.0000      0.00  Q         |         |         |         |
14+35       0.0000      0.00  Q         |         |         |         |
14+40       0.0000      0.00  Q         |         |         |         |
14+45       0.0000      0.00  Q         |         |         |         |
14+50       0.0000      0.00  Q         |         |         |         |
14+55       0.0000      0.00  Q         |         |         |         |
15+ 0       0.0000      0.00  Q         |         |         |         |
15+ 5       0.0000      0.00  Q         |         |         |         |
15+10       0.0000      0.00  Q         |         |         |         |
15+15       0.0000      0.00  Q         |         |         |         |
15+20       0.0000      0.00  Q         |         |         |         |
15+25       0.0000      0.00  Q         |         |         |         |
15+30       0.0000      0.00  Q         |         |         |         |
15+35       0.0000      0.00  Q         |         |         |         |
15+40       0.0000      0.00  Q         |         |         |         |
15+45       0.0000      0.00  Q         |         |         |         |
15+50       0.0000      0.00  Q         |         |         |         |
15+55       0.0000      0.00  Q         |         |         |         |
16+ 0       0.0000      0.00  Q         |         |         |         |
16+ 5       0.0021      0.30  VQ        |         |         |         |
16+10       0.0087      0.96  |  Q      |         |         |         |
16+15       0.0203      1.68  |     QV  |         |         |         |
16+20       0.0359      2.27  |        Q|   V     |         |         |
16+25       0.0518      2.31  |        Q|         V         |         |
16+30       0.0630      1.63  |     Q   |         |   V     |         |
16+35       0.0702      1.05  |   Q     |         |      V  |         |
16+40       0.0751      0.71  | Q       |         |        V|         |
16+45       0.0786      0.52  | Q       |         |         V         |
```

```
16+50       0.0816      0.44  |Q        |         |         |V        |
16+55       0.0842      0.37  |Q        |         |         | V       |
17+ 0       0.0864      0.32  |Q        |         |         |  V      |
17+ 5       0.0883      0.28  |Q        |         |         |   V     |
17+10       0.0899      0.23  Q         |         |         |    V    |
17+15       0.0912      0.20  Q         |         |         |    V    |
17+20       0.0926      0.19  Q         |         |         |     V   |
17+25       0.0936      0.15  Q         |         |         |     V   |
17+30       0.0946      0.15  Q         |         |         |      V  |
17+35       0.0954      0.12  Q         |         |         |      V  |
17+40       0.0962      0.11  Q         |         |         |      V  |
17+45       0.0969      0.10  Q         |         |         |      V  |
17+50       0.0976      0.10  Q         |         |         |       V |
17+55       0.0982      0.09  Q         |         |         |       V |
18+ 0       0.0987      0.07  Q         |         |         |       V |
18+ 5       0.0992      0.07  Q         |         |         |       V |
18+10       0.0996      0.06  Q         |         |         |       V |
18+15       0.1000      0.06  Q         |         |         |        V|
18+20       0.1004      0.05  Q         |         |         |        V|
18+25       0.1007      0.05  Q         |         |         |        V|
18+30       0.1009      0.04  Q         |         |         |        V|
18+35       0.1012      0.03  Q         |         |         |        V|
18+40       0.1014      0.03  Q         |         |         |        V|
18+45       0.1016      0.03  Q         |         |         |        V|
18+50       0.1019      0.03  Q         |         |         |        V|
18+55       0.1021      0.03  Q         |         |         |        V|
19+ 0       0.1023      0.03  Q         |         |         |         V
19+ 5       0.1023      0.00  Q         |         |         |         V
19+10       0.1023      0.00  Q         |         |         |         V
19+15       0.1023      0.00  Q         |         |         |         V
19+20       0.1023      0.00  Q         |         |         |         V
19+25       0.1023      0.00  Q         |         |         |         V
19+30       0.1023      0.00  Q         |         |         |         V
19+35       0.1023      0.00  Q         |         |         |         V
19+40       0.1023      0.00  Q         |         |         |         V
19+45       0.1023      0.00  Q         |         |         |         V
19+50       0.1023      0.00  Q         |         |         |         V
19+55       0.1023      0.00  Q         |         |         |         V
20+ 0       0.1023      0.00  Q         |         |         |         V
20+ 5       0.1023      0.00  Q         |         |         |         V
20+10       0.1023      0.00  Q         |         |         |         V
20+15       0.1023      0.00  Q         |         |         |         V
20+20       0.1023      0.00  Q         |         |         |         V
20+25       0.1023      0.00  Q         |         |         |         V
20+30       0.1023      0.00  Q         |         |         |         V
20+35       0.1023      0.00  Q         |         |         |         V
20+40       0.1023      0.00  Q         |         |         |         V
20+45       0.1023      0.00  Q         |         |         |         V
20+50       0.1023      0.00  Q         |         |         |         V
20+55       0.1023      0.00  Q         |         |         |         V
21+ 0       0.1023      0.00  Q         |         |         |         V
21+ 5       0.1023      0.00  Q         |         |         |         V
21+10       0.1023      0.00  Q         |         |         |         V
21+15       0.1023      0.00  Q         |         |         |         V
21+20       0.1023      0.00  Q         |         |         |         V
21+25       0.1023      0.00  Q         |         |         |         V
21+30       0.1023      0.00  Q         |         |         |         V
21+35       0.1023      0.00  Q         |         |         |         V
21+40       0.1023      0.00  Q         |         |         |         V
21+45       0.1023      0.00  Q         |         |         |         V
21+50       0.1023      0.00  Q         |         |         |         V
21+55       0.1023      0.00  Q         |         |         |         V
22+ 0       0.1023      0.00  Q         |         |         |         V
22+ 5       0.1023      0.00  Q         |         |         |         V
22+10       0.1023      0.00  Q         |         |         |         V
22+15       0.1023      0.00  Q         |         |         |         V
22+20       0.1023      0.00  Q         |         |         |         V
22+25       0.1023      0.00  Q         |         |         |         V
22+30       0.1023      0.00  Q         |         |         |         V
22+35       0.1023      0.00  Q         |         |         |         V
22+40       0.1023      0.00  Q         |         |         |         V
22+45       0.1023      0.00  Q         |         |         |         V
22+50       0.1023      0.00  Q         |         |         |         V
```

```
   22+55       0.1023      0.00  Q         |         |         |         V
   23+ 0       0.1023      0.00  Q         |         |         |         V
   23+ 5       0.1023      0.00  Q         |         |         |         V
   23+10       0.1023      0.00  Q         |         |         |         V
   23+15       0.1023      0.00  Q         |         |         |         V
   23+20       0.1023      0.00  Q         |         |         |         V
   23+25       0.1023      0.00  Q         |         |         |         V
   23+30       0.1023      0.00  Q         |         |         |         V
   23+35       0.1023      0.00  Q         |         |         |         V
   23+40       0.1023      0.00  Q         |         |         |         V
   23+45       0.1023      0.00  Q         |         |         |         V
   23+50       0.1023      0.00  Q         |         |         |         V
   23+55       0.1023      0.00  Q         |         |         |         V
   24+ 0       0.1023      0.00  Q         |         |         |         V
   24+ 5       0.1023      0.00  Q         |         |         |         V
   24+10       0.1023      0.00  Q         |         |         |         V
   24+15       0.1023      0.00  Q         |         |         |         V
   24+20       0.1023      0.00  Q         |         |         |         V
   24+25       0.1023      0.00  Q         |         |         |         V
   24+30       0.1023      0.00  Q         |         |         |         V
   24+35       0.1023      0.00  Q         |         |         |         V
   24+40       0.1023      0.00  Q         |         |         |         V
   24+45       0.1023      0.00  Q         |         |         |         V
   24+50       0.1023      0.00  Q         |         |         |         V
   24+55       0.1023      0.00  Q         |         |         |         V
   25+ 0       0.1023      0.00  Q         |         |         |         V
   25+ 5       0.1023      0.00  Q         |         |         |         V
   25+10       0.1023      0.00  Q         |         |         |         V
   25+15       0.1023      0.00  Q         |         |         |         V
   25+20       0.1023      0.00  Q         |         |         |         V
   25+25       0.1023      0.00  Q         |         |         |         V
   25+30       0.1023      0.00  Q         |         |         |         V
   25+35       0.1023      0.00  Q         |         |         |         V
   25+40       0.1023      0.00  Q         |         |         |         V
   25+45       0.1023      0.00  Q         |         |         |         V
   25+50       0.1023      0.00  Q         |         |         |         V
   25+55       0.1023      0.00  Q         |         |         |         V
   26+ 0       0.1023      0.00  Q         |         |         |         V
   26+ 5       0.1023      0.00  Q         |         |         |         V
   26+10       0.1023      0.00  Q         |         |         |         V
   26+15       0.1023      0.00  Q         |         |         |         V
   26+20       0.1023      0.00  Q         |         |         |         V
   26+25       0.1023      0.00  Q         |         |         |         V
   26+30       0.1023      0.00  Q         |         |         |         V
   26+35       0.1023      0.00  Q         |         |         |         V
   26+40       0.1023      0.00  Q         |         |         |         V
   26+45       0.1023      0.00  Q         |         |         |         V
   26+50       0.1023      0.00  Q         |         |         |         V
   26+55       0.1023      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

        Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018, Version 9.0

                Study date  03/22/21


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
------------------------------------------------------------------------

San Bernardino County Synthetic Unit Hydrology Method
                Manual date - August 1986


Program License Serial Number 6320

---------------------------------------------------------------------
204828 - TEC EQUIPMENT 776 MILL ST
EXISITNG CONDITIONS
10-YEAR, 24-HOUR STORM
BY: JTS  DATE: 03-22-21
--------------------------------------------------------------------

        Storm Event Year = 10

        Antecedent Moisture Condition = 2

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format




Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 10
             7.01            1           0.83
--------------------------------------------------------------------
Rainfall data for year 2
             7.01            6           1.41
--------------------------------------------------------------------
Rainfall data for year 2
             7.01           24           2.40
--------------------------------------------------------------------
Rainfall data for year 100
             7.01            1           1.28
--------------------------------------------------------------------
Rainfall data for year 100
             7.01            6           2.60
--------------------------------------------------------------------
Rainfall data for year 100
             7.01           24           5.90
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 2)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 50.0      50.0          7.01      1.000     0.810    1.000    0.810

Area-averaged adjusted loss rate Fm (In/Hr) =  0.810

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
```

```
     7.01   1.000         50.0      50.0      10.00     0.074

Area-averaged catchment yield fraction, Y =  0.074
Area-averaged low loss fraction, Yb =  0.926
User entry of time of concentration  =   0.460 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       7.01(Ac.)
Catchment Lag time =   0.368 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 22.6449
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.810(In/Hr)
Average low loss rate fraction (Yb) = 0.926 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.307(In)
Computed peak 30-minute rainfall =  0.629(In)
Specified peak 1-hour rainfall =  0.830(In)
Computed peak 3-hour rainfall =  1.379(In)
Specified peak 6-hour rainfall =  1.900(In)
Specified peak 24-hour rainfall =  3.840(In)


Rainfall depth area reduction factors:
Using a total area of       7.01(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.307(In)
30-minute factor = 1.000    Adjusted rainfall =  0.629(In)
1-hour factor = 1.000       Adjusted rainfall =  0.830(In)
3-hour factor = 1.000       Adjusted rainfall =  1.379(In)
6-hour factor = 1.000       Adjusted rainfall =  1.900(In)
24-hour factor = 1.000      Adjusted rainfall =  3.840(In)
---------------------------------------------------------------------

                        U n i t   H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
---------------------------------------------------------------------
                (K =        84.78 (CFS))

  1                2.049                  1.737
  2                8.477                  5.450
  3               19.785                  9.587
  4               35.087                 12.972
  5               50.623                 13.171
  6               61.571                  9.282
  7               68.622                  5.977
  8               73.370                  4.025
  9               76.878                  2.974
 10               79.814                  2.489
 11               82.277                  2.088
 12               84.416                  1.814
 13               86.277                  1.577
 14               87.834                  1.320
 15               89.201                  1.159
 16               90.506                  1.106
 17               91.540                  0.877
 18               92.521                  0.832
 19               93.306                  0.665
 20               94.030                  0.614
 21               94.727                  0.591
 22               95.406                  0.576
 23               96.009                  0.511
 24               96.507                  0.423
 25               96.983                  0.403
 26               97.394                  0.349
 27               97.790                  0.336
 28               98.118                  0.278
 29               98.431                  0.265
 30               98.680                  0.211
 31               98.907                  0.192
 32               99.133                  0.192
 33               99.360                  0.192
```

```
 34              99.586                   0.192
 35              99.812                   0.192
 36             100.000                   0.159
-------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number             (In)                (In)
  1             0.3071               0.3071
  2             0.4052               0.0981
  3             0.4766               0.0713
  4             0.5347               0.0581
  5             0.5846               0.0499
  6             0.6288               0.0442
  7             0.6688               0.0400
  8             0.7055               0.0367
  9             0.7395               0.0340
 10             0.7714               0.0318
 11             0.8013               0.0300
 12             0.8297               0.0284
 13             0.8610               0.0313
 14             0.8910               0.0300
 15             0.9199               0.0289
 16             0.9478               0.0279
 17             0.9747               0.0269
 18             1.0008               0.0261
 19             1.0261               0.0253
 20             1.0508               0.0246
 21             1.0747               0.0240
 22             1.0981               0.0234
 23             1.1209               0.0228
 24             1.1432               0.0223
 25             1.1650               0.0218
 26             1.1863               0.0213
 27             1.2072               0.0209
 28             1.2276               0.0205
 29             1.2477               0.0201
 30             1.2674               0.0197
 31             1.2868               0.0194
 32             1.3058               0.0190
 33             1.3245               0.0187
 34             1.3429               0.0184
 35             1.3611               0.0181
 36             1.3789               0.0178
 37             1.3965               0.0176
 38             1.4138               0.0173
 39             1.4309               0.0171
 40             1.4477               0.0168
 41             1.4643               0.0166
 42             1.4807               0.0164
 43             1.4969               0.0162
 44             1.5129               0.0160
 45             1.5287               0.0158
 46             1.5443               0.0156
 47             1.5597               0.0154
 48             1.5750               0.0152
 49             1.5900               0.0151
 50             1.6050               0.0149
 51             1.6197               0.0148
 52             1.6343               0.0146
 53             1.6488               0.0144
 54             1.6631               0.0143
 55             1.6772               0.0142
 56             1.6913               0.0140
 57             1.7051               0.0139
 58             1.7189               0.0138
 59             1.7325               0.0136
 60             1.7460               0.0135
 61             1.7594               0.0134
 62             1.7727               0.0133
 63             1.7859               0.0132
 64             1.7989               0.0130
 65             1.8118               0.0129
 66             1.8247               0.0128
 67             1.8374               0.0127
```

68	1.8500	0.0126
69	1.8625	0.0125
70	1.8750	0.0124
71	1.8873	0.0123
72	1.8995	0.0122
73	1.9129	0.0133
74	1.9261	0.0133
75	1.9393	0.0132
76	1.9524	0.0131
77	1.9654	0.0130
78	1.9783	0.0129
79	1.9912	0.0128
80	2.0039	0.0128
81	2.0166	0.0127
82	2.0292	0.0126
83	2.0417	0.0125
84	2.0542	0.0125
85	2.0666	0.0124
86	2.0789	0.0123
87	2.0911	0.0122
88	2.1033	0.0122
89	2.1154	0.0121
90	2.1274	0.0120
91	2.1394	0.0120
92	2.1513	0.0119
93	2.1631	0.0118
94	2.1749	0.0118
95	2.1866	0.0117
96	2.1983	0.0117
97	2.2099	0.0116
98	2.2214	0.0115
99	2.2329	0.0115
100	2.2443	0.0114
101	2.2557	0.0114
102	2.2670	0.0113
103	2.2782	0.0113
104	2.2894	0.0112
105	2.3006	0.0112
106	2.3117	0.0111
107	2.3227	0.0110
108	2.3337	0.0110
109	2.3447	0.0109
110	2.3556	0.0109
111	2.3664	0.0108
112	2.3772	0.0108
113	2.3880	0.0108
114	2.3987	0.0107
115	2.4093	0.0107
116	2.4200	0.0106
117	2.4305	0.0106
118	2.4410	0.0105
119	2.4515	0.0105
120	2.4620	0.0104
121	2.4724	0.0104
122	2.4827	0.0104
123	2.4930	0.0103
124	2.5033	0.0103
125	2.5135	0.0102
126	2.5237	0.0102
127	2.5339	0.0101
128	2.5440	0.0101
129	2.5540	0.0101
130	2.5641	0.0100
131	2.5741	0.0100
132	2.5840	0.0100
133	2.5940	0.0099
134	2.6038	0.0099
135	2.6137	0.0098
136	2.6235	0.0098
137	2.6333	0.0098
138	2.6430	0.0097
139	2.6527	0.0097
140	2.6624	0.0097

141	2.6720	0.0096
142	2.6816	0.0096
143	2.6912	0.0096
144	2.7007	0.0095
145	2.7102	0.0095
146	2.7197	0.0095
147	2.7292	0.0094
148	2.7386	0.0094
149	2.7480	0.0094
150	2.7573	0.0093
151	2.7666	0.0093
152	2.7759	0.0093
153	2.7852	0.0093
154	2.7944	0.0092
155	2.8036	0.0092
156	2.8128	0.0092
157	2.8219	0.0091
158	2.8310	0.0091
159	2.8401	0.0091
160	2.8491	0.0091
161	2.8582	0.0090
162	2.8672	0.0090
163	2.8761	0.0090
164	2.8851	0.0089
165	2.8940	0.0089
166	2.9029	0.0089
167	2.9118	0.0089
168	2.9206	0.0088
169	2.9294	0.0088
170	2.9382	0.0088
171	2.9470	0.0088
172	2.9557	0.0087
173	2.9644	0.0087
174	2.9731	0.0087
175	2.9818	0.0087
176	2.9904	0.0086
177	2.9990	0.0086
178	3.0076	0.0086
179	3.0162	0.0086
180	3.0247	0.0085
181	3.0332	0.0085
182	3.0417	0.0085
183	3.0502	0.0085
184	3.0587	0.0085
185	3.0671	0.0084
186	3.0755	0.0084
187	3.0839	0.0084
188	3.0922	0.0084
189	3.1006	0.0083
190	3.1089	0.0083
191	3.1172	0.0083
192	3.1255	0.0083
193	3.1337	0.0083
194	3.1420	0.0082
195	3.1502	0.0082
196	3.1584	0.0082
197	3.1665	0.0082
198	3.1747	0.0082
199	3.1828	0.0081
200	3.1909	0.0081
201	3.1990	0.0081
202	3.2071	0.0081
203	3.2151	0.0081
204	3.2232	0.0080
205	3.2312	0.0080
206	3.2392	0.0080
207	3.2472	0.0080
208	3.2551	0.0080
209	3.2630	0.0079
210	3.2710	0.0079
211	3.2789	0.0079
212	3.2867	0.0079
213	3.2946	0.0079

214	3.3024	0.0078
215	3.3103	0.0078
216	3.3181	0.0078
217	3.3259	0.0078
218	3.3336	0.0078
219	3.3414	0.0078
220	3.3491	0.0077
221	3.3569	0.0077
222	3.3646	0.0077
223	3.3722	0.0077
224	3.3799	0.0077
225	3.3876	0.0077
226	3.3952	0.0076
227	3.4028	0.0076
228	3.4104	0.0076
229	3.4180	0.0076
230	3.4256	0.0076
231	3.4331	0.0076
232	3.4407	0.0075
233	3.4482	0.0075
234	3.4557	0.0075
235	3.4632	0.0075
236	3.4707	0.0075
237	3.4781	0.0075
238	3.4856	0.0074
239	3.4930	0.0074
240	3.5004	0.0074
241	3.5078	0.0074
242	3.5152	0.0074
243	3.5226	0.0074
244	3.5299	0.0074
245	3.5372	0.0073
246	3.5446	0.0073
247	3.5519	0.0073
248	3.5592	0.0073
249	3.5664	0.0073
250	3.5737	0.0073
251	3.5810	0.0073
252	3.5882	0.0072
253	3.5954	0.0072
254	3.6026	0.0072
255	3.6098	0.0072
256	3.6170	0.0072
257	3.6242	0.0072
258	3.6313	0.0072
259	3.6385	0.0071
260	3.6456	0.0071
261	3.6527	0.0071
262	3.6598	0.0071
263	3.6669	0.0071
264	3.6740	0.0071
265	3.6810	0.0071
266	3.6881	0.0070
267	3.6951	0.0070
268	3.7021	0.0070
269	3.7091	0.0070
270	3.7161	0.0070
271	3.7231	0.0070
272	3.7301	0.0070
273	3.7370	0.0070
274	3.7440	0.0069
275	3.7509	0.0069
276	3.7578	0.0069
277	3.7647	0.0069
278	3.7716	0.0069
279	3.7785	0.0069
280	3.7854	0.0069
281	3.7922	0.0069
282	3.7991	0.0068
283	3.8059	0.0068
284	3.8127	0.0068
285	3.8195	0.0068
286	3.8263	0.0068

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287              3.8331               0.0068
288              3.8399               0.0068
----------------------------------------------------------------------
Unit              Unit            Unit               Effective
Period            Rainfall        Soil-Loss          Rainfall
(number)            (In)          (In)                  (In)
----------------------------------------------------------------------
  1              0.0068           0.0063               0.0005
  2              0.0068           0.0063               0.0005
  3              0.0068           0.0063               0.0005
  4              0.0068           0.0063               0.0005
  5              0.0068           0.0063               0.0005
  6              0.0069           0.0063               0.0005
  7              0.0069           0.0064               0.0005
  8              0.0069           0.0064               0.0005
  9              0.0069           0.0064               0.0005
 10              0.0069           0.0064               0.0005
 11              0.0070           0.0064               0.0005
 12              0.0070           0.0064               0.0005
 13              0.0070           0.0065               0.0005
 14              0.0070           0.0065               0.0005
 15              0.0070           0.0065               0.0005
 16              0.0070           0.0065               0.0005
 17              0.0071           0.0065               0.0005
 18              0.0071           0.0066               0.0005
 19              0.0071           0.0066               0.0005
 20              0.0071           0.0066               0.0005
 21              0.0072           0.0066               0.0005
 22              0.0072           0.0066               0.0005
 23              0.0072           0.0067               0.0005
 24              0.0072           0.0067               0.0005
 25              0.0072           0.0067               0.0005
 26              0.0073           0.0067               0.0005
 27              0.0073           0.0067               0.0005
 28              0.0073           0.0068               0.0005
 29              0.0073           0.0068               0.0005
 30              0.0073           0.0068               0.0005
 31              0.0074           0.0068               0.0005
 32              0.0074           0.0068               0.0005
 33              0.0074           0.0069               0.0006
 34              0.0074           0.0069               0.0006
 35              0.0075           0.0069               0.0006
 36              0.0075           0.0069               0.0006
 37              0.0075           0.0069               0.0006
 38              0.0075           0.0070               0.0006
 39              0.0076           0.0070               0.0006
 40              0.0076           0.0070               0.0006
 41              0.0076           0.0070               0.0006
 42              0.0076           0.0071               0.0006
 43              0.0077           0.0071               0.0006
 44              0.0077           0.0071               0.0006
 45              0.0077           0.0071               0.0006
 46              0.0077           0.0071               0.0006
 47              0.0078           0.0072               0.0006
 48              0.0078           0.0072               0.0006
 49              0.0078           0.0072               0.0006
 50              0.0078           0.0072               0.0006
 51              0.0079           0.0073               0.0006
 52              0.0079           0.0073               0.0006
 53              0.0079           0.0073               0.0006
 54              0.0079           0.0073               0.0006
 55              0.0080           0.0074               0.0006
 56              0.0080           0.0074               0.0006
 57              0.0080           0.0074               0.0006
 58              0.0081           0.0075               0.0006
 59              0.0081           0.0075               0.0006
 60              0.0081           0.0075               0.0006
 61              0.0082           0.0075               0.0006
 62              0.0082           0.0076               0.0006
 63              0.0082           0.0076               0.0006
 64              0.0082           0.0076               0.0006
 65              0.0083           0.0077               0.0006
 66              0.0083           0.0077               0.0006
```

67	0.0083	0.0077	0.0006
68	0.0084	0.0077	0.0006
69	0.0084	0.0078	0.0006
70	0.0084	0.0078	0.0006
71	0.0085	0.0078	0.0006
72	0.0085	0.0079	0.0006
73	0.0085	0.0079	0.0006
74	0.0086	0.0079	0.0006
75	0.0086	0.0080	0.0006
76	0.0086	0.0080	0.0006
77	0.0087	0.0080	0.0006
78	0.0087	0.0081	0.0006
79	0.0088	0.0081	0.0007
80	0.0088	0.0081	0.0007
81	0.0088	0.0082	0.0007
82	0.0089	0.0082	0.0007
83	0.0089	0.0083	0.0007
84	0.0089	0.0083	0.0007
85	0.0090	0.0083	0.0007
86	0.0090	0.0084	0.0007
87	0.0091	0.0084	0.0007
88	0.0091	0.0084	0.0007
89	0.0092	0.0085	0.0007
90	0.0092	0.0085	0.0007
91	0.0093	0.0086	0.0007
92	0.0093	0.0086	0.0007
93	0.0093	0.0087	0.0007
94	0.0094	0.0087	0.0007
95	0.0094	0.0087	0.0007
96	0.0095	0.0088	0.0007
97	0.0095	0.0088	0.0007
98	0.0096	0.0089	0.0007
99	0.0096	0.0089	0.0007
100	0.0097	0.0090	0.0007
101	0.0097	0.0090	0.0007
102	0.0098	0.0090	0.0007
103	0.0098	0.0091	0.0007
104	0.0099	0.0091	0.0007
105	0.0100	0.0092	0.0007
106	0.0100	0.0093	0.0007
107	0.0101	0.0093	0.0007
108	0.0101	0.0094	0.0008
109	0.0102	0.0094	0.0008
110	0.0102	0.0095	0.0008
111	0.0103	0.0095	0.0008
112	0.0104	0.0096	0.0008
113	0.0104	0.0097	0.0008
114	0.0105	0.0097	0.0008
115	0.0106	0.0098	0.0008
116	0.0106	0.0098	0.0008
117	0.0107	0.0099	0.0008
118	0.0108	0.0100	0.0008
119	0.0108	0.0100	0.0008
120	0.0109	0.0101	0.0008
121	0.0110	0.0102	0.0008
122	0.0110	0.0102	0.0008
123	0.0112	0.0103	0.0008
124	0.0112	0.0104	0.0008
125	0.0113	0.0105	0.0008
126	0.0114	0.0105	0.0008
127	0.0115	0.0106	0.0009
128	0.0115	0.0107	0.0009
129	0.0117	0.0108	0.0009
130	0.0117	0.0108	0.0009
131	0.0118	0.0110	0.0009
132	0.0119	0.0110	0.0009
133	0.0120	0.0111	0.0009
134	0.0121	0.0112	0.0009
135	0.0122	0.0113	0.0009
136	0.0123	0.0114	0.0009
137	0.0125	0.0115	0.0009
138	0.0125	0.0116	0.0009
139	0.0127	0.0117	0.0009

140	0.0128	0.0118	0.0009
141	0.0129	0.0120	0.0010
142	0.0130	0.0120	0.0010
143	0.0132	0.0122	0.0010
144	0.0133	0.0123	0.0010
145	0.0122	0.0113	0.0009
146	0.0123	0.0114	0.0009
147	0.0125	0.0116	0.0009
148	0.0126	0.0117	0.0009
149	0.0128	0.0119	0.0010
150	0.0129	0.0120	0.0010
151	0.0132	0.0122	0.0010
152	0.0133	0.0123	0.0010
153	0.0135	0.0125	0.0010
154	0.0136	0.0126	0.0010
155	0.0139	0.0129	0.0010
156	0.0140	0.0130	0.0010
157	0.0143	0.0132	0.0011
158	0.0144	0.0134	0.0011
159	0.0148	0.0137	0.0011
160	0.0149	0.0138	0.0011
161	0.0152	0.0141	0.0011
162	0.0154	0.0143	0.0011
163	0.0158	0.0146	0.0012
164	0.0160	0.0148	0.0012
165	0.0164	0.0152	0.0012
166	0.0166	0.0154	0.0012
167	0.0171	0.0158	0.0013
168	0.0173	0.0160	0.0013
169	0.0178	0.0165	0.0013
170	0.0181	0.0168	0.0013
171	0.0187	0.0173	0.0014
172	0.0190	0.0176	0.0014
173	0.0197	0.0182	0.0015
174	0.0201	0.0186	0.0015
175	0.0209	0.0193	0.0016
176	0.0213	0.0197	0.0016
177	0.0223	0.0206	0.0017
178	0.0228	0.0211	0.0017
179	0.0240	0.0222	0.0018
180	0.0246	0.0228	0.0018
181	0.0261	0.0242	0.0019
182	0.0269	0.0249	0.0020
183	0.0289	0.0267	0.0022
184	0.0300	0.0278	0.0022
185	0.0284	0.0263	0.0021
186	0.0300	0.0277	0.0022
187	0.0340	0.0315	0.0025
188	0.0367	0.0340	0.0027
189	0.0442	0.0409	0.0033
190	0.0499	0.0462	0.0037
191	0.0713	0.0660	0.0053
192	0.0981	0.0675	0.0307
193	0.3071	0.0675	0.2396
194	0.0581	0.0538	0.0043
195	0.0400	0.0370	0.0030
196	0.0318	0.0295	0.0024
197	0.0313	0.0290	0.0023
198	0.0279	0.0258	0.0021
199	0.0253	0.0234	0.0019
200	0.0234	0.0216	0.0017
201	0.0218	0.0202	0.0016
202	0.0205	0.0189	0.0015
203	0.0194	0.0179	0.0014
204	0.0184	0.0170	0.0014
205	0.0176	0.0163	0.0013
206	0.0168	0.0156	0.0013
207	0.0162	0.0150	0.0012
208	0.0156	0.0144	0.0012
209	0.0151	0.0140	0.0011
210	0.0146	0.0135	0.0011
211	0.0142	0.0131	0.0011
212	0.0138	0.0127	0.0010

213	0.0134	0.0124	0.0010
214	0.0130	0.0121	0.0010
215	0.0127	0.0118	0.0009
216	0.0124	0.0115	0.0009
217	0.0133	0.0124	0.0010
218	0.0131	0.0121	0.0010
219	0.0128	0.0119	0.0010
220	0.0126	0.0117	0.0009
221	0.0124	0.0115	0.0009
222	0.0122	0.0113	0.0009
223	0.0120	0.0111	0.0009
224	0.0118	0.0109	0.0009
225	0.0116	0.0107	0.0009
226	0.0114	0.0106	0.0009
227	0.0113	0.0104	0.0008
228	0.0111	0.0103	0.0008
229	0.0109	0.0101	0.0008
230	0.0108	0.0100	0.0008
231	0.0107	0.0099	0.0008
232	0.0105	0.0097	0.0008
233	0.0104	0.0096	0.0008
234	0.0103	0.0095	0.0008
235	0.0101	0.0094	0.0008
236	0.0100	0.0093	0.0007
237	0.0099	0.0092	0.0007
238	0.0098	0.0091	0.0007
239	0.0097	0.0090	0.0007
240	0.0096	0.0089	0.0007
241	0.0095	0.0088	0.0007
242	0.0094	0.0087	0.0007
243	0.0093	0.0086	0.0007
244	0.0092	0.0085	0.0007
245	0.0091	0.0085	0.0007
246	0.0091	0.0084	0.0007
247	0.0090	0.0083	0.0007
248	0.0089	0.0082	0.0007
249	0.0088	0.0082	0.0007
250	0.0087	0.0081	0.0007
251	0.0087	0.0080	0.0006
252	0.0086	0.0080	0.0006
253	0.0085	0.0079	0.0006
254	0.0085	0.0078	0.0006
255	0.0084	0.0078	0.0006
256	0.0083	0.0077	0.0006
257	0.0083	0.0076	0.0006
258	0.0082	0.0076	0.0006
259	0.0081	0.0075	0.0006
260	0.0081	0.0075	0.0006
261	0.0080	0.0074	0.0006
262	0.0080	0.0074	0.0006
263	0.0079	0.0073	0.0006
264	0.0078	0.0073	0.0006
265	0.0078	0.0072	0.0006
266	0.0077	0.0072	0.0006
267	0.0077	0.0071	0.0006
268	0.0076	0.0071	0.0006
269	0.0076	0.0070	0.0006
270	0.0075	0.0070	0.0006
271	0.0075	0.0069	0.0006
272	0.0074	0.0069	0.0006
273	0.0074	0.0068	0.0006
274	0.0074	0.0068	0.0005
275	0.0073	0.0068	0.0005
276	0.0073	0.0067	0.0005
277	0.0072	0.0067	0.0005
278	0.0072	0.0066	0.0005
279	0.0071	0.0066	0.0005
280	0.0071	0.0066	0.0005
281	0.0071	0.0065	0.0005
282	0.0070	0.0065	0.0005
283	0.0070	0.0065	0.0005
284	0.0069	0.0064	0.0005
285	0.0069	0.0064	0.0005

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      286              0.0069           0.0064              0.0005
      287              0.0068           0.0063              0.0005
      288              0.0068           0.0063              0.0005
      --------------------------------------------------------------------
      --------------------------------------------------------------------
      Total soil rain loss =      3.31(In)
      Total effective rainfall =      0.53(In)
      Peak flow rate in flood hydrograph =      3.71(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
-----------------------------------------------------------------------
  0+ 5       0.0000      0.00  Q         |         |         |         |
  0+10       0.0000      0.00  Q         |         |         |         |
  0+15       0.0001      0.01  Q         |         |         |         |
  0+20       0.0002      0.02  Q         |         |         |         |
  0+25       0.0003      0.02  Q         |         |         |         |
  0+30       0.0005      0.03  Q         |         |         |         |
  0+35       0.0007      0.03  Q         |         |         |         |
  0+40       0.0009      0.03  Q         |         |         |         |
  0+45       0.0012      0.03  Q         |         |         |         |
  0+50       0.0014      0.03  Q         |         |         |         |
  0+55       0.0017      0.04  Q         |         |         |         |
  1+ 0       0.0019      0.04  Q         |         |         |         |
  1+ 5       0.0022      0.04  Q         |         |         |         |
  1+10       0.0024      0.04  Q         |         |         |         |
  1+15       0.0027      0.04  Q         |         |         |         |
  1+20       0.0030      0.04  Q         |         |         |         |
  1+25       0.0033      0.04  Q         |         |         |         |
  1+30       0.0035      0.04  Q         |         |         |         |
  1+35       0.0038      0.04  Q         |         |         |         |
  1+40       0.0041      0.04  Q         |         |         |         |
  1+45       0.0044      0.04  Q         |         |         |         |
  1+50       0.0047      0.04  Q         |         |         |         |
  1+55       0.0050      0.04  Q         |         |         |         |
  2+ 0       0.0053      0.04  Q         |         |         |         |
  2+ 5       0.0056      0.04  Q         |         |         |         |
  2+10       0.0059      0.04  Q         |         |         |         |
  2+15       0.0062      0.04  Q         |         |         |         |
  2+20       0.0065      0.04  Q         |         |         |         |
  2+25       0.0068      0.04  Q         |         |         |         |
  2+30       0.0071      0.04  Q         |         |         |         |
  2+35       0.0074      0.05  Q         |         |         |         |
  2+40       0.0077      0.05  QV        |         |         |         |
  2+45       0.0080      0.05  QV        |         |         |         |
  2+50       0.0084      0.05  QV        |         |         |         |
  2+55       0.0087      0.05  QV        |         |         |         |
  3+ 0       0.0090      0.05  QV        |         |         |         |
  3+ 5       0.0093      0.05  QV        |         |         |         |
  3+10       0.0096      0.05  QV        |         |         |         |
  3+15       0.0100      0.05  QV        |         |         |         |
  3+20       0.0103      0.05  QV        |         |         |         |
  3+25       0.0106      0.05  QV        |         |         |         |
  3+30       0.0109      0.05  QV        |         |         |         |
  3+35       0.0113      0.05  QV        |         |         |         |
  3+40       0.0116      0.05  QV        |         |         |         |
  3+45       0.0119      0.05  QV        |         |         |         |
  3+50       0.0122      0.05  QV        |         |         |         |
  3+55       0.0126      0.05  QV        |         |         |         |
  4+ 0       0.0129      0.05  QV        |         |         |         |
  4+ 5       0.0132      0.05  QV        |         |         |         |
  4+10       0.0136      0.05  QV        |         |         |         |
  4+15       0.0139      0.05  QV        |         |         |         |
  4+20       0.0142      0.05  QV        |         |         |         |
  4+25       0.0146      0.05  QV        |         |         |         |
  4+30       0.0149      0.05  QV        |         |         |         |
  4+35       0.0152      0.05  QV        |         |         |         |
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 4+40       0.0156      0.05  Q V       |         |         |         |
 4+45       0.0159      0.05  Q V       |         |         |         |
 4+50       0.0163      0.05  Q V       |         |         |         |
 4+55       0.0166      0.05  Q V       |         |         |         |
 5+ 0       0.0170      0.05  Q V       |         |         |         |
 5+ 5       0.0173      0.05  Q V       |         |         |         |
 5+10       0.0177      0.05  Q V       |         |         |         |
 5+15       0.0180      0.05  Q V       |         |         |         |
 5+20       0.0184      0.05  Q V       |         |         |         |
 5+25       0.0187      0.05  Q V       |         |         |         |
 5+30       0.0191      0.05  Q V       |         |         |         |
 5+35       0.0194      0.05  Q V       |         |         |         |
 5+40       0.0198      0.05  Q V       |         |         |         |
 5+45       0.0201      0.05  Q V       |         |         |         |
 5+50       0.0205      0.05  Q V       |         |         |         |
 5+55       0.0208      0.05  Q V       |         |         |         |
 6+ 0       0.0212      0.05  Q V       |         |         |         |
 6+ 5       0.0216      0.05  Q V       |         |         |         |
 6+10       0.0219      0.05  Q V       |         |         |         |
 6+15       0.0223      0.05  Q V       |         |         |         |
 6+20       0.0227      0.05  Q V       |         |         |         |
 6+25       0.0230      0.05  Q V       |         |         |         |
 6+30       0.0234      0.05  Q  V      |         |         |         |
 6+35       0.0238      0.05  Q  V      |         |         |         |
 6+40       0.0241      0.05  Q  V      |         |         |         |
 6+45       0.0245      0.05  Q  V      |         |         |         |
 6+50       0.0249      0.05  Q  V      |         |         |         |
 6+55       0.0253      0.05  Q  V      |         |         |         |
 7+ 0       0.0256      0.05  Q  V      |         |         |         |
 7+ 5       0.0260      0.06  Q  V      |         |         |         |
 7+10       0.0264      0.06  Q  V      |         |         |         |
 7+15       0.0268      0.06  Q  V      |         |         |         |
 7+20       0.0272      0.06  Q  V      |         |         |         |
 7+25       0.0276      0.06  Q  V      |         |         |         |
 7+30       0.0279      0.06  Q  V      |         |         |         |
 7+35       0.0283      0.06  Q  V      |         |         |         |
 7+40       0.0287      0.06  Q  V      |         |         |         |
 7+45       0.0291      0.06  Q  V      |         |         |         |
 7+50       0.0295      0.06  Q  V      |         |         |         |
 7+55       0.0299      0.06  Q  V      |         |         |         |
 8+ 0       0.0303      0.06  Q  V      |         |         |         |
 8+ 5       0.0307      0.06  Q  V      |         |         |         |
 8+10       0.0311      0.06  Q   V     |         |         |         |
 8+15       0.0315      0.06  Q   V     |         |         |         |
 8+20       0.0319      0.06  Q   V     |         |         |         |
 8+25       0.0323      0.06  Q   V     |         |         |         |
 8+30       0.0327      0.06  Q   V     |         |         |         |
 8+35       0.0332      0.06  Q   V     |         |         |         |
 8+40       0.0336      0.06  Q   V     |         |         |         |
 8+45       0.0340      0.06  Q   V     |         |         |         |
 8+50       0.0344      0.06  Q   V     |         |         |         |
 8+55       0.0348      0.06  Q   V     |         |         |         |
 9+ 0       0.0353      0.06  Q   V     |         |         |         |
 9+ 5       0.0357      0.06  Q   V     |         |         |         |
 9+10       0.0361      0.06  Q   V     |         |         |         |
 9+15       0.0365      0.06  Q   V     |         |         |         |
 9+20       0.0370      0.06  Q   V     |         |         |         |
 9+25       0.0374      0.06  Q   V     |         |         |         |
 9+30       0.0379      0.06  Q   V     |         |         |         |
 9+35       0.0383      0.06  Q   V     |         |         |         |
 9+40       0.0387      0.06  Q    V    |         |         |         |
 9+45       0.0392      0.06  Q    V    |         |         |         |
 9+50       0.0396      0.07  Q    V    |         |         |         |
 9+55       0.0401      0.07  Q    V    |         |         |         |
10+ 0       0.0405      0.07  Q    V    |         |         |         |
10+ 5       0.0410      0.07  Q    V    |         |         |         |
10+10       0.0415      0.07  Q    V    |         |         |         |
10+15       0.0419      0.07  Q    V    |         |         |         |
10+20       0.0424      0.07  Q    V    |         |         |         |
10+25       0.0429      0.07  Q    V    |         |         |         |
10+30       0.0433      0.07  Q    V    |         |         |         |
10+35       0.0438      0.07  Q    V    |         |         |         |
10+40       0.0443      0.07  Q    V    |         |         |         |
```

```
10+45       0.0448       0.07  Q    V    |         |         |         |
10+50       0.0453       0.07  Q    V    |         |         |         |
10+55       0.0458       0.07  Q    V    |         |         |         |
11+ 0       0.0463       0.07  Q     V   |         |         |         |
11+ 5       0.0468       0.07  Q     V   |         |         |         |
11+10       0.0473       0.07  Q     V   |         |         |         |
11+15       0.0478       0.07  Q     V   |         |         |         |
11+20       0.0483       0.07  Q     V   |         |         |         |
11+25       0.0488       0.07  Q     V   |         |         |         |
11+30       0.0493       0.08  Q     V   |         |         |         |
11+35       0.0498       0.08  Q     V   |         |         |         |
11+40       0.0503       0.08  Q     V   |         |         |         |
11+45       0.0509       0.08  Q     V   |         |         |         |
11+50       0.0514       0.08  Q     V   |         |         |         |
11+55       0.0519       0.08  Q     V   |         |         |         |
12+ 0       0.0525       0.08  Q     V   |         |         |         |
12+ 5       0.0530       0.08  Q     V   |         |         |         |
12+10       0.0536       0.08  Q     V   |         |         |         |
12+15       0.0541       0.08  Q      V  |         |         |         |
12+20       0.0547       0.08  Q      V  |         |         |         |
12+25       0.0552       0.08  Q      V  |         |         |         |
12+30       0.0558       0.08  Q      V  |         |         |         |
12+35       0.0563       0.08  Q      V  |         |         |         |
12+40       0.0569       0.08  Q      V  |         |         |         |
12+45       0.0574       0.08  Q      V  |         |         |         |
12+50       0.0580       0.08  Q      V  |         |         |         |
12+55       0.0586       0.08  Q      V  |         |         |         |
13+ 0       0.0591       0.08  Q      V  |         |         |         |
13+ 5       0.0597       0.08  Q      V  |         |         |         |
13+10       0.0603       0.08  Q      V  |         |         |         |
13+15       0.0609       0.09  Q      V  |         |         |         |
13+20       0.0615       0.09  Q       V |         |         |         |
13+25       0.0621       0.09  Q       V |         |         |         |
13+30       0.0627       0.09  Q       V |         |         |         |
13+35       0.0633       0.09  Q       V |         |         |         |
13+40       0.0640       0.09  Q       V |         |         |         |
13+45       0.0646       0.09  Q       V |         |         |         |
13+50       0.0652       0.09  Q       V |         |         |         |
13+55       0.0659       0.10  Q       V |         |         |         |
14+ 0       0.0666       0.10  Q       V |         |         |         |
14+ 5       0.0673       0.10  Q       V |         |         |         |
14+10       0.0680       0.10  Q       V |         |         |         |
14+15       0.0687       0.10  Q       V |         |         |         |
14+20       0.0694       0.11  Q        V|         |         |         |
14+25       0.0702       0.11  Q        V|         |         |         |
14+30       0.0709       0.11  Q        V|         |         |         |
14+35       0.0717       0.11  Q        V|         |         |         |
14+40       0.0725       0.12  Q        V|         |         |         |
14+45       0.0733       0.12  Q        V|         |         |         |
14+50       0.0742       0.12  Q        V|         |         |         |
14+55       0.0750       0.13  Q        V|         |         |         |
15+ 0       0.0759       0.13  Q        V|         |         |         |
15+ 5       0.0768       0.13  Q         V         |         |         |
15+10       0.0778       0.14  Q         V         |         |         |
15+15       0.0788       0.14  Q         V         |         |         |
15+20       0.0798       0.15  Q         V         |         |         |
15+25       0.0808       0.15  Q         V         |         |         |
15+30       0.0819       0.16  Q         V         |         |         |
15+35       0.0831       0.17  Q         V         |         |         |
15+40       0.0843       0.17  Q         V         |         |         |
15+45       0.0855       0.18  Q         |V        |         |         |
15+50       0.0868       0.19  Q         |V        |         |         |
15+55       0.0883       0.21  Q         |V        |         |         |
16+ 0       0.0902       0.28  |Q        |V        |         |         |
16+ 5       0.0958       0.82  |  Q      | V       |         |         |
16+10       0.1084       1.82  |      Q  |   V     |         |         |
16+15       0.1284       2.90  |         |Q    V   |         |         |
16+20       0.1539       3.71  |         |   Q     V         |         |
16+25       0.1789       3.64  |         |   Q     |  V      |         |
16+30       0.1970       2.62  |         Q         |    V    |         |
16+35       0.2091       1.77  |      Q  |         |      V  |         |
16+40       0.2178       1.26  |    Q    |         |       V |         |
16+45       0.2245       0.98  |  Q      |         |        V|         |
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16+50       0.2303      0.84  |  Q      |         |        V|         |
16+55       0.2353      0.73  | Q       |         |         V         |
17+ 0       0.2398      0.65  | Q       |         |         |V        |
17+ 5       0.2437      0.57  | Q       |         |         |V        |
17+10       0.2472      0.50  | Q       |         |         | V       |
17+15       0.2503      0.45  |Q        |         |         | V       |
17+20       0.2533      0.43  |Q        |         |         | V       |
17+25       0.2558      0.37  |Q        |         |         |  V      |
17+30       0.2581      0.34  |Q        |         |         |  V      |
17+35       0.2602      0.30  |Q        |         |         |  V      |
17+40       0.2621      0.28  |Q        |         |         |   V     |
17+45       0.2640      0.27  |Q        |         |         |   V     |
17+50       0.2658      0.26  |Q        |         |         |   V     |
17+55       0.2675      0.24  Q         |         |         |   V     |
18+ 0       0.2689      0.21  Q         |         |         |    V    |
18+ 5       0.2704      0.21  Q         |         |         |    V    |
18+10       0.2717      0.19  Q         |         |         |    V    |
18+15       0.2729      0.18  Q         |         |         |    V    |
18+20       0.2741      0.17  Q         |         |         |    V    |
18+25       0.2752      0.16  Q         |         |         |    V    |
18+30       0.2762      0.15  Q         |         |         |    V    |
18+35       0.2772      0.14  Q         |         |         |     V   |
18+40       0.2781      0.14  Q         |         |         |     V   |
18+45       0.2790      0.14  Q         |         |         |     V   |
18+50       0.2800      0.13  Q         |         |         |     V   |
18+55       0.2809      0.13  Q         |         |         |     V   |
19+ 0       0.2817      0.12  Q         |         |         |     V   |
19+ 5       0.2822      0.08  Q         |         |         |     V   |
19+10       0.2828      0.08  Q         |         |         |     V   |
19+15       0.2833      0.08  Q         |         |         |     V   |
19+20       0.2838      0.07  Q         |         |         |     V   |
19+25       0.2843      0.07  Q         |         |         |      V  |
19+30       0.2848      0.07  Q         |         |         |      V  |
19+35       0.2853      0.07  Q         |         |         |      V  |
19+40       0.2857      0.07  Q         |         |         |      V  |
19+45       0.2862      0.07  Q         |         |         |      V  |
19+50       0.2867      0.07  Q         |         |         |      V  |
19+55       0.2871      0.07  Q         |         |         |      V  |
20+ 0       0.2876      0.07  Q         |         |         |      V  |
20+ 5       0.2880      0.07  Q         |         |         |      V  |
20+10       0.2885      0.06  Q         |         |         |      V  |
20+15       0.2889      0.06  Q         |         |         |      V  |
20+20       0.2894      0.06  Q         |         |         |      V  |
20+25       0.2898      0.06  Q         |         |         |      V  |
20+30       0.2902      0.06  Q         |         |         |      V  |
20+35       0.2906      0.06  Q         |         |         |      V  |
20+40       0.2910      0.06  Q         |         |         |      V  |
20+45       0.2915      0.06  Q         |         |         |      V  |
20+50       0.2919      0.06  Q         |         |         |       V |
20+55       0.2923      0.06  Q         |         |         |       V |
21+ 0       0.2927      0.06  Q         |         |         |       V |
21+ 5       0.2931      0.06  Q         |         |         |       V |
21+10       0.2935      0.06  Q         |         |         |       V |
21+15       0.2938      0.06  Q         |         |         |       V |
21+20       0.2942      0.06  Q         |         |         |       V |
21+25       0.2946      0.06  Q         |         |         |       V |
21+30       0.2950      0.05  Q         |         |         |       V |
21+35       0.2954      0.05  Q         |         |         |       V |
21+40       0.2957      0.05  Q         |         |         |       V |
21+45       0.2961      0.05  Q         |         |         |       V |
21+50       0.2965      0.05  Q         |         |         |       V |
21+55       0.2968      0.05  Q         |         |         |       V |
22+ 0       0.2972      0.05  Q         |         |         |       V |
22+ 5       0.2975      0.05  Q         |         |         |       V |
22+10       0.2979      0.05  Q         |         |         |       V |
22+15       0.2982      0.05  Q         |         |         |       V |
22+20       0.2986      0.05  Q         |         |         |       V |
22+25       0.2989      0.05  Q         |         |         |       V |
22+30       0.2993      0.05  Q         |         |         |       V |
22+35       0.2996      0.05  Q         |         |         |        V|
22+40       0.3000      0.05  Q         |         |         |        V|
22+45       0.3003      0.05  Q         |         |         |        V|
22+50       0.3006      0.05  Q         |         |         |        V|
```

```
  22+55       0.3010      0.05  Q         |         |         |        V|
  23+ 0       0.3013      0.05  Q         |         |         |        V|
  23+ 5       0.3016      0.05  Q         |         |         |        V|
  23+10       0.3020      0.05  Q         |         |         |        V|
  23+15       0.3023      0.05  Q         |         |         |        V|
  23+20       0.3026      0.05  Q         |         |         |        V|
  23+25       0.3029      0.05  Q         |         |         |        V|
  23+30       0.3032      0.05  Q         |         |         |        V|
  23+35       0.3036      0.05  Q         |         |         |        V|
  23+40       0.3039      0.05  Q         |         |         |        V|
  23+45       0.3042      0.05  Q         |         |         |        V|
  23+50       0.3045      0.05  Q         |         |         |        V|
  23+55       0.3048      0.04  Q         |         |         |        V|
  24+ 0       0.3051      0.04  Q         |         |         |        V|
  24+ 5       0.3054      0.04  Q         |         |         |        V|
  24+10       0.3057      0.04  Q         |         |         |        V|
  24+15       0.3059      0.04  Q         |         |         |        V|
  24+20       0.3061      0.03  Q         |         |         |        V|
  24+25       0.3063      0.02  Q         |         |         |        V|
  24+30       0.3064      0.02  Q         |         |         |        V|
  24+35       0.3065      0.01  Q         |         |         |        V|
  24+40       0.3066      0.01  Q         |         |         |        V|
  24+45       0.3066      0.01  Q         |         |         |        V|
  24+50       0.3067      0.01  Q         |         |         |        V|
  24+55       0.3068      0.01  Q         |         |         |        V|
  25+ 0       0.3068      0.01  Q         |         |         |        V|
  25+ 5       0.3068      0.01  Q         |         |         |        V|
  25+10       0.3069      0.01  Q         |         |         |        V|
  25+15       0.3069      0.00  Q         |         |         |        V|
  25+20       0.3069      0.00  Q         |         |         |        V|
  25+25       0.3070      0.00  Q         |         |         |        V|
  25+30       0.3070      0.00  Q         |         |         |        V|
  25+35       0.3070      0.00  Q         |         |         |        V|
  25+40       0.3070      0.00  Q         |         |         |        V|
  25+45       0.3070      0.00  Q         |         |         |        V|
  25+50       0.3071      0.00  Q         |         |         |        V|
  25+55       0.3071      0.00  Q         |         |         |        V|
  26+ 0       0.3071      0.00  Q         |         |         |        V|
  26+ 5       0.3071      0.00  Q         |         |         |        V|
  26+10       0.3071      0.00  Q         |         |         |        V|
  26+15       0.3071      0.00  Q         |         |         |        V|
  26+20       0.3071      0.00  Q         |         |         |        V|
  26+25       0.3071      0.00  Q         |         |         |        V|
  26+30       0.3071      0.00  Q         |         |         |        V|
  26+35       0.3071      0.00  Q         |         |         |        V|
  26+40       0.3071      0.00  Q         |         |         |        V|
  26+45       0.3071      0.00  Q         |         |         |        V|
  26+50       0.3071      0.00  Q         |         |         |        V|
  26+55       0.3071      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

        Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018, Version 9.0

                Study date  03/22/21


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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San Bernardino County Synthetic Unit Hydrology Method
                Manual date - August 1986


Program License Serial Number 6320

---------------------------------------------------------------------
204828 - TEC EQUIPMENT 776 MILL ST
EXISITNG CONDITIONS
25-YEAR, 24-HOUR STORM
BY: JTS  DATE: 03-22-21
--------------------------------------------------------------------

        Storm Event Year = 25

        Antecedent Moisture Condition = 2

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format




Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 10
             7.01           1           0.83
--------------------------------------------------------------------
Rainfall data for year 2
             7.01           6           1.41
--------------------------------------------------------------------
Rainfall data for year 2
             7.01          24           2.40
--------------------------------------------------------------------
Rainfall data for year 100
             7.01           1           1.28
--------------------------------------------------------------------
Rainfall data for year 100
             7.01           6           2.60
--------------------------------------------------------------------
Rainfall data for year 100
             7.01          24           5.90
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 2)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 50.0      50.0          7.01      1.000     0.810    1.000    0.810

Area-averaged adjusted loss rate Fm (In/Hr) =  0.810

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
```

```
     7.01   1.000         50.0      50.0      10.00     0.120

Area-averaged catchment yield fraction, Y =  0.120
Area-averaged low loss fraction, Yb =  0.880
User entry of time of concentration  =   0.460 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       7.01(Ac.)
Catchment Lag time =   0.368 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 22.6449
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.810(In/Hr)
Average low loss rate fraction (Yb) = 0.880 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.373(In)
Computed peak 30-minute rainfall =  0.765(In)
Specified peak 1-hour rainfall =  1.009(In)
Computed peak 3-hour rainfall =  1.617(In)
Specified peak 6-hour rainfall =  2.178(In)
Specified peak 24-hour rainfall =  4.660(In)


Rainfall depth area reduction factors:
Using a total area of       7.01(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.373(In)
30-minute factor = 1.000    Adjusted rainfall =  0.764(In)
1-hour factor = 1.000       Adjusted rainfall =  1.009(In)
3-hour factor = 1.000       Adjusted rainfall =  1.617(In)
6-hour factor = 1.000       Adjusted rainfall =  2.178(In)
24-hour factor = 1.000      Adjusted rainfall =  4.660(In)
---------------------------------------------------------------------

                        U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
---------------------------------------------------------------------
                (K =        84.78 (CFS))

  1                2.049                   1.737
  2                8.477                   5.450
  3               19.785                   9.587
  4               35.087                  12.972
  5               50.623                  13.171
  6               61.571                   9.282
  7               68.622                   5.977
  8               73.370                   4.025
  9               76.878                   2.974
 10               79.814                   2.489
 11               82.277                   2.088
 12               84.416                   1.814
 13               86.277                   1.577
 14               87.834                   1.320
 15               89.201                   1.159
 16               90.506                   1.106
 17               91.540                   0.877
 18               92.521                   0.832
 19               93.306                   0.665
 20               94.030                   0.614
 21               94.727                   0.591
 22               95.406                   0.576
 23               96.009                   0.511
 24               96.507                   0.423
 25               96.983                   0.403
 26               97.394                   0.349
 27               97.790                   0.336
 28               98.118                   0.278
 29               98.431                   0.265
 30               98.680                   0.211
 31               98.907                   0.192
 32               99.133                   0.192
 33               99.360                   0.192
```

```
 34              99.586                   0.192
 35              99.812                   0.192
 36             100.000                   0.159
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number              (In)                (In)
  1              0.3733               0.3733
  2              0.4926               0.1193
  3              0.5794               0.0867
  4              0.6500               0.0707
  5              0.7107               0.0607
  6              0.7645               0.0538
  7              0.8131               0.0486
  8              0.8577               0.0446
  9              0.8991               0.0414
 10              0.9378               0.0387
 11              0.9742               0.0364
 12              1.0087               0.0345
 13              1.0440               0.0353
 14              1.0778               0.0338
 15              1.1103               0.0324
 16              1.1415               0.0312
 17              1.1716               0.0301
 18              1.2007               0.0291
 19              1.2290               0.0282
 20              1.2564               0.0274
 21              1.2830               0.0266
 22              1.3089               0.0259
 23              1.3341               0.0252
 24              1.3588               0.0246
 25              1.3828               0.0240
 26              1.4063               0.0235
 27              1.4293               0.0230
 28              1.4518               0.0225
 29              1.4739               0.0221
 30              1.4955               0.0216
 31              1.5167               0.0212
 32              1.5376               0.0208
 33              1.5580               0.0205
 34              1.5781               0.0201
 35              1.5979               0.0198
 36              1.6174               0.0195
 37              1.6365               0.0191
 38              1.6554               0.0189
 39              1.6740               0.0186
 40              1.6923               0.0183
 41              1.7103               0.0180
 42              1.7281               0.0178
 43              1.7457               0.0176
 44              1.7630               0.0173
 45              1.7801               0.0171
 46              1.7970               0.0169
 47              1.8136               0.0167
 48              1.8301               0.0165
 49              1.8464               0.0163
 50              1.8625               0.0161
 51              1.8784               0.0159
 52              1.8941               0.0157
 53              1.9097               0.0156
 54              1.9251               0.0154
 55              1.9403               0.0152
 56              1.9554               0.0151
 57              1.9703               0.0149
 58              1.9851               0.0148
 59              1.9997               0.0146
 60              2.0142               0.0145
 61              2.0285               0.0144
 62              2.0428               0.0142
 63              2.0568               0.0141
 64              2.0708               0.0140
 65              2.0846               0.0138
 66              2.0984               0.0137
 67              2.1119               0.0136
```

68	2.1254	0.0135
69	2.1388	0.0134
70	2.1521	0.0133
71	2.1652	0.0132
72	2.1783	0.0130
73	2.1948	0.0165
74	2.2112	0.0164
75	2.2276	0.0163
76	2.2438	0.0162
77	2.2600	0.0161
78	2.2760	0.0161
79	2.2920	0.0160
80	2.3079	0.0159
81	2.3236	0.0158
82	2.3393	0.0157
83	2.3549	0.0156
84	2.3705	0.0155
85	2.3859	0.0154
86	2.4012	0.0154
87	2.4165	0.0153
88	2.4317	0.0152
89	2.4468	0.0151
90	2.4619	0.0150
91	2.4768	0.0150
92	2.4917	0.0149
93	2.5066	0.0148
94	2.5213	0.0147
95	2.5360	0.0147
96	2.5506	0.0146
97	2.5651	0.0145
98	2.5796	0.0145
99	2.5940	0.0144
100	2.6083	0.0143
101	2.6226	0.0143
102	2.6368	0.0142
103	2.6510	0.0141
104	2.6651	0.0141
105	2.6791	0.0140
106	2.6931	0.0140
107	2.7070	0.0139
108	2.7208	0.0138
109	2.7346	0.0138
110	2.7483	0.0137
111	2.7620	0.0137
112	2.7756	0.0136
113	2.7892	0.0136
114	2.8027	0.0135
115	2.8162	0.0135
116	2.8296	0.0134
117	2.8429	0.0134
118	2.8562	0.0133
119	2.8695	0.0133
120	2.8827	0.0132
121	2.8958	0.0132
122	2.9090	0.0131
123	2.9220	0.0131
124	2.9350	0.0130
125	2.9480	0.0130
126	2.9609	0.0129
127	2.9738	0.0129
128	2.9866	0.0128
129	2.9994	0.0128
130	3.0121	0.0127
131	3.0248	0.0127
132	3.0374	0.0126
133	3.0500	0.0126
134	3.0626	0.0126
135	3.0751	0.0125
136	3.0876	0.0125
137	3.1000	0.0124
138	3.1124	0.0124
139	3.1247	0.0124
140	3.1370	0.0123

141	3.1493	0.0123
142	3.1616	0.0122
143	3.1737	0.0122
144	3.1859	0.0122
145	3.1980	0.0121
146	3.2101	0.0121
147	3.2221	0.0120
148	3.2341	0.0120
149	3.2461	0.0120
150	3.2580	0.0119
151	3.2699	0.0119
152	3.2818	0.0119
153	3.2936	0.0118
154	3.3054	0.0118
155	3.3172	0.0118
156	3.3289	0.0117
157	3.3406	0.0117
158	3.3522	0.0117
159	3.3639	0.0116
160	3.3754	0.0116
161	3.3870	0.0116
162	3.3985	0.0115
163	3.4100	0.0115
164	3.4215	0.0115
165	3.4329	0.0114
166	3.4443	0.0114
167	3.4557	0.0114
168	3.4670	0.0113
169	3.4783	0.0113
170	3.4896	0.0113
171	3.5008	0.0112
172	3.5120	0.0112
173	3.5232	0.0112
174	3.5344	0.0112
175	3.5455	0.0111
176	3.5566	0.0111
177	3.5677	0.0111
178	3.5787	0.0110
179	3.5897	0.0110
180	3.6007	0.0110
181	3.6117	0.0110
182	3.6226	0.0109
183	3.6335	0.0109
184	3.6444	0.0109
185	3.6552	0.0109
186	3.6661	0.0108
187	3.6769	0.0108
188	3.6876	0.0108
189	3.6984	0.0107
190	3.7091	0.0107
191	3.7198	0.0107
192	3.7305	0.0107
193	3.7411	0.0106
194	3.7517	0.0106
195	3.7623	0.0106
196	3.7729	0.0106
197	3.7835	0.0105
198	3.7940	0.0105
199	3.8045	0.0105
200	3.8150	0.0105
201	3.8254	0.0105
202	3.8358	0.0104
203	3.8462	0.0104
204	3.8566	0.0104
205	3.8670	0.0104
206	3.8773	0.0103
207	3.8876	0.0103
208	3.8979	0.0103
209	3.9082	0.0103
210	3.9184	0.0102
211	3.9287	0.0102
212	3.9389	0.0102
213	3.9490	0.0102

214	3.9592	0.0102
215	3.9693	0.0101
216	3.9794	0.0101
217	3.9895	0.0101
218	3.9996	0.0101
219	4.0097	0.0101
220	4.0197	0.0100
221	4.0297	0.0100
222	4.0397	0.0100
223	4.0497	0.0100
224	4.0596	0.0100
225	4.0696	0.0099
226	4.0795	0.0099
227	4.0894	0.0099
228	4.0992	0.0099
229	4.1091	0.0099
230	4.1189	0.0098
231	4.1287	0.0098
232	4.1385	0.0098
233	4.1483	0.0098
234	4.1581	0.0098
235	4.1678	0.0097
236	4.1775	0.0097
237	4.1872	0.0097
238	4.1969	0.0097
239	4.2066	0.0097
240	4.2162	0.0096
241	4.2258	0.0096
242	4.2354	0.0096
243	4.2450	0.0096
244	4.2546	0.0096
245	4.2642	0.0096
246	4.2737	0.0095
247	4.2832	0.0095
248	4.2927	0.0095
249	4.3022	0.0095
250	4.3117	0.0095
251	4.3211	0.0095
252	4.3306	0.0094
253	4.3400	0.0094
254	4.3494	0.0094
255	4.3588	0.0094
256	4.3681	0.0094
257	4.3775	0.0094
258	4.3868	0.0093
259	4.3961	0.0093
260	4.4054	0.0093
261	4.4147	0.0093
262	4.4240	0.0093
263	4.4333	0.0093
264	4.4425	0.0092
265	4.4517	0.0092
266	4.4609	0.0092
267	4.4701	0.0092
268	4.4793	0.0092
269	4.4885	0.0092
270	4.4976	0.0091
271	4.5067	0.0091
272	4.5158	0.0091
273	4.5249	0.0091
274	4.5340	0.0091
275	4.5431	0.0091
276	4.5522	0.0091
277	4.5612	0.0090
278	4.5702	0.0090
279	4.5792	0.0090
280	4.5882	0.0090
281	4.5972	0.0090
282	4.6062	0.0090
283	4.6151	0.0090
284	4.6241	0.0089
285	4.6330	0.0089
286	4.6419	0.0089

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287              4.6508               0.0089
288              4.6597               0.0089
--------------------------------------------------------------------
Unit              Unit            Unit              Effective
Period            Rainfall        Soil-Loss         Rainfall
(number)            (In)          (In)                 (In)
--------------------------------------------------------------------
  1              0.0089           0.0078              0.0011
  2              0.0089           0.0078              0.0011
  3              0.0089           0.0079              0.0011
  4              0.0089           0.0079              0.0011
  5              0.0090           0.0079              0.0011
  6              0.0090           0.0079              0.0011
  7              0.0090           0.0079              0.0011
  8              0.0090           0.0079              0.0011
  9              0.0091           0.0080              0.0011
 10              0.0091           0.0080              0.0011
 11              0.0091           0.0080              0.0011
 12              0.0091           0.0080              0.0011
 13              0.0091           0.0080              0.0011
 14              0.0092           0.0081              0.0011
 15              0.0092           0.0081              0.0011
 16              0.0092           0.0081              0.0011
 17              0.0092           0.0081              0.0011
 18              0.0093           0.0081              0.0011
 19              0.0093           0.0082              0.0011
 20              0.0093           0.0082              0.0011
 21              0.0093           0.0082              0.0011
 22              0.0094           0.0082              0.0011
 23              0.0094           0.0083              0.0011
 24              0.0094           0.0083              0.0011
 25              0.0094           0.0083              0.0011
 26              0.0095           0.0083              0.0011
 27              0.0095           0.0083              0.0011
 28              0.0095           0.0084              0.0011
 29              0.0095           0.0084              0.0011
 30              0.0096           0.0084              0.0011
 31              0.0096           0.0084              0.0012
 32              0.0096           0.0085              0.0012
 33              0.0096           0.0085              0.0012
 34              0.0097           0.0085              0.0012
 35              0.0097           0.0085              0.0012
 36              0.0097           0.0086              0.0012
 37              0.0098           0.0086              0.0012
 38              0.0098           0.0086              0.0012
 39              0.0098           0.0086              0.0012
 40              0.0098           0.0087              0.0012
 41              0.0099           0.0087              0.0012
 42              0.0099           0.0087              0.0012
 43              0.0099           0.0087              0.0012
 44              0.0100           0.0088              0.0012
 45              0.0100           0.0088              0.0012
 46              0.0100           0.0088              0.0012
 47              0.0101           0.0088              0.0012
 48              0.0101           0.0089              0.0012
 49              0.0101           0.0089              0.0012
 50              0.0101           0.0089              0.0012
 51              0.0102           0.0090              0.0012
 52              0.0102           0.0090              0.0012
 53              0.0102           0.0090              0.0012
 54              0.0103           0.0090              0.0012
 55              0.0103           0.0091              0.0012
 56              0.0103           0.0091              0.0012
 57              0.0104           0.0091              0.0012
 58              0.0104           0.0092              0.0012
 59              0.0105           0.0092              0.0013
 60              0.0105           0.0092              0.0013
 61              0.0105           0.0093              0.0013
 62              0.0105           0.0093              0.0013
 63              0.0106           0.0093              0.0013
 64              0.0106           0.0093              0.0013
 65              0.0107           0.0094              0.0013
 66              0.0107           0.0094              0.0013
```

67	0.0107	0.0095	0.0013
68	0.0108	0.0095	0.0013
69	0.0108	0.0095	0.0013
70	0.0109	0.0095	0.0013
71	0.0109	0.0096	0.0013
72	0.0109	0.0096	0.0013
73	0.0110	0.0097	0.0013
74	0.0110	0.0097	0.0013
75	0.0111	0.0097	0.0013
76	0.0111	0.0098	0.0013
77	0.0112	0.0098	0.0013
78	0.0112	0.0098	0.0013
79	0.0112	0.0099	0.0013
80	0.0113	0.0099	0.0014
81	0.0113	0.0100	0.0014
82	0.0114	0.0100	0.0014
83	0.0114	0.0101	0.0014
84	0.0115	0.0101	0.0014
85	0.0115	0.0101	0.0014
86	0.0116	0.0102	0.0014
87	0.0116	0.0102	0.0014
88	0.0117	0.0103	0.0014
89	0.0117	0.0103	0.0014
90	0.0118	0.0103	0.0014
91	0.0118	0.0104	0.0014
92	0.0119	0.0104	0.0014
93	0.0119	0.0105	0.0014
94	0.0120	0.0105	0.0014
95	0.0120	0.0106	0.0014
96	0.0121	0.0106	0.0014
97	0.0122	0.0107	0.0015
98	0.0122	0.0107	0.0015
99	0.0123	0.0108	0.0015
100	0.0123	0.0108	0.0015
101	0.0124	0.0109	0.0015
102	0.0124	0.0109	0.0015
103	0.0125	0.0110	0.0015
104	0.0126	0.0111	0.0015
105	0.0126	0.0111	0.0015
106	0.0127	0.0112	0.0015
107	0.0128	0.0112	0.0015
108	0.0128	0.0113	0.0015
109	0.0129	0.0114	0.0015
110	0.0130	0.0114	0.0016
111	0.0131	0.0115	0.0016
112	0.0131	0.0115	0.0016
113	0.0132	0.0116	0.0016
114	0.0133	0.0117	0.0016
115	0.0134	0.0118	0.0016
116	0.0134	0.0118	0.0016
117	0.0135	0.0119	0.0016
118	0.0136	0.0119	0.0016
119	0.0137	0.0120	0.0016
120	0.0137	0.0121	0.0016
121	0.0138	0.0122	0.0017
122	0.0139	0.0122	0.0017
123	0.0140	0.0123	0.0017
124	0.0141	0.0124	0.0017
125	0.0142	0.0125	0.0017
126	0.0143	0.0126	0.0017
127	0.0144	0.0127	0.0017
128	0.0145	0.0127	0.0017
129	0.0146	0.0129	0.0018
130	0.0147	0.0129	0.0018
131	0.0148	0.0130	0.0018
132	0.0149	0.0131	0.0018
133	0.0150	0.0132	0.0018
134	0.0151	0.0133	0.0018
135	0.0153	0.0134	0.0018
136	0.0154	0.0135	0.0018
137	0.0155	0.0137	0.0019
138	0.0156	0.0137	0.0019
139	0.0158	0.0139	0.0019

140	0.0159	0.0140	0.0019
141	0.0161	0.0141	0.0019
142	0.0161	0.0142	0.0019
143	0.0163	0.0144	0.0020
144	0.0164	0.0145	0.0020
145	0.0130	0.0115	0.0016
146	0.0132	0.0116	0.0016
147	0.0134	0.0118	0.0016
148	0.0135	0.0119	0.0016
149	0.0137	0.0121	0.0016
150	0.0138	0.0122	0.0017
151	0.0141	0.0124	0.0017
152	0.0142	0.0125	0.0017
153	0.0145	0.0128	0.0017
154	0.0146	0.0129	0.0018
155	0.0149	0.0131	0.0018
156	0.0151	0.0133	0.0018
157	0.0154	0.0135	0.0018
158	0.0156	0.0137	0.0019
159	0.0159	0.0140	0.0019
160	0.0161	0.0142	0.0019
161	0.0165	0.0145	0.0020
162	0.0167	0.0147	0.0020
163	0.0171	0.0150	0.0021
164	0.0173	0.0152	0.0021
165	0.0178	0.0157	0.0021
166	0.0180	0.0159	0.0022
167	0.0186	0.0163	0.0022
168	0.0189	0.0166	0.0023
169	0.0195	0.0171	0.0023
170	0.0198	0.0174	0.0024
171	0.0205	0.0180	0.0025
172	0.0208	0.0183	0.0025
173	0.0216	0.0190	0.0026
174	0.0221	0.0194	0.0026
175	0.0230	0.0202	0.0028
176	0.0235	0.0207	0.0028
177	0.0246	0.0217	0.0030
178	0.0252	0.0222	0.0030
179	0.0266	0.0234	0.0032
180	0.0274	0.0241	0.0033
181	0.0291	0.0256	0.0035
182	0.0301	0.0265	0.0036
183	0.0324	0.0285	0.0039
184	0.0338	0.0297	0.0041
185	0.0345	0.0304	0.0041
186	0.0364	0.0321	0.0044
187	0.0414	0.0364	0.0050
188	0.0446	0.0393	0.0053
189	0.0538	0.0473	0.0064
190	0.0607	0.0534	0.0073
191	0.0867	0.0675	0.0193
192	0.1193	0.0675	0.0518
193	0.3733	0.0675	0.3059
194	0.0707	0.0622	0.0085
195	0.0486	0.0428	0.0058
196	0.0387	0.0341	0.0046
197	0.0353	0.0311	0.0042
198	0.0312	0.0275	0.0037
199	0.0282	0.0248	0.0034
200	0.0259	0.0228	0.0031
201	0.0240	0.0212	0.0029
202	0.0225	0.0198	0.0027
203	0.0212	0.0187	0.0025
204	0.0201	0.0177	0.0024
205	0.0191	0.0168	0.0023
206	0.0183	0.0161	0.0022
207	0.0176	0.0154	0.0021
208	0.0169	0.0149	0.0020
209	0.0163	0.0143	0.0020
210	0.0157	0.0138	0.0019
211	0.0152	0.0134	0.0018
212	0.0148	0.0130	0.0018

213	0.0144	0.0126	0.0017
214	0.0140	0.0123	0.0017
215	0.0136	0.0120	0.0016
216	0.0133	0.0117	0.0016
217	0.0165	0.0146	0.0020
218	0.0162	0.0143	0.0019
219	0.0160	0.0140	0.0019
220	0.0157	0.0138	0.0019
221	0.0154	0.0136	0.0019
222	0.0152	0.0134	0.0018
223	0.0150	0.0132	0.0018
224	0.0147	0.0130	0.0018
225	0.0145	0.0128	0.0017
226	0.0143	0.0126	0.0017
227	0.0141	0.0125	0.0017
228	0.0140	0.0123	0.0017
229	0.0138	0.0121	0.0017
230	0.0136	0.0120	0.0016
231	0.0135	0.0118	0.0016
232	0.0133	0.0117	0.0016
233	0.0132	0.0116	0.0016
234	0.0130	0.0114	0.0016
235	0.0129	0.0113	0.0015
236	0.0127	0.0112	0.0015
237	0.0126	0.0111	0.0015
238	0.0125	0.0110	0.0015
239	0.0124	0.0109	0.0015
240	0.0122	0.0108	0.0015
241	0.0121	0.0107	0.0015
242	0.0120	0.0106	0.0014
243	0.0119	0.0105	0.0014
244	0.0118	0.0104	0.0014
245	0.0117	0.0103	0.0014
246	0.0116	0.0102	0.0014
247	0.0115	0.0101	0.0014
248	0.0114	0.0100	0.0014
249	0.0113	0.0099	0.0014
250	0.0112	0.0099	0.0013
251	0.0111	0.0098	0.0013
252	0.0110	0.0097	0.0013
253	0.0110	0.0096	0.0013
254	0.0109	0.0096	0.0013
255	0.0108	0.0095	0.0013
256	0.0107	0.0094	0.0013
257	0.0106	0.0094	0.0013
258	0.0106	0.0093	0.0013
259	0.0105	0.0092	0.0013
260	0.0104	0.0092	0.0013
261	0.0104	0.0091	0.0012
262	0.0103	0.0091	0.0012
263	0.0102	0.0090	0.0012
264	0.0102	0.0089	0.0012
265	0.0101	0.0089	0.0012
266	0.0100	0.0088	0.0012
267	0.0100	0.0088	0.0012
268	0.0099	0.0087	0.0012
269	0.0099	0.0087	0.0012
270	0.0098	0.0086	0.0012
271	0.0097	0.0086	0.0012
272	0.0097	0.0085	0.0012
273	0.0096	0.0085	0.0012
274	0.0096	0.0084	0.0011
275	0.0095	0.0084	0.0011
276	0.0095	0.0083	0.0011
277	0.0094	0.0083	0.0011
278	0.0094	0.0082	0.0011
279	0.0093	0.0082	0.0011
280	0.0093	0.0082	0.0011
281	0.0092	0.0081	0.0011
282	0.0092	0.0081	0.0011
283	0.0091	0.0080	0.0011
284	0.0091	0.0080	0.0011
285	0.0090	0.0080	0.0011

```
      286              0.0090           0.0079              0.0011
      287              0.0090           0.0079              0.0011
      288              0.0089           0.0078              0.0011
      --------------------------------------------------------------------
      --------------------------------------------------------------------
      Total soil rain loss =      3.79(In)
      Total effective rainfall =      0.87(In)
      Peak flow rate in flood hydrograph =      5.11(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
-----------------------------------------------------------------------
  0+ 5       0.0000      0.00  Q         |         |         |         |
  0+10       0.0001      0.01  Q         |         |         |         |
  0+15       0.0002      0.02  Q         |         |         |         |
  0+20       0.0004      0.03  Q         |         |         |         |
  0+25       0.0007      0.05  Q         |         |         |         |
  0+30       0.0011      0.06  Q         |         |         |         |
  0+35       0.0015      0.06  Q         |         |         |         |
  0+40       0.0020      0.07  Q         |         |         |         |
  0+45       0.0025      0.07  Q         |         |         |         |
  0+50       0.0030      0.07  Q         |         |         |         |
  0+55       0.0035      0.08  Q         |         |         |         |
  1+ 0       0.0040      0.08  Q         |         |         |         |
  1+ 5       0.0046      0.08  Q         |         |         |         |
  1+10       0.0051      0.08  Q         |         |         |         |
  1+15       0.0057      0.08  Q         |         |         |         |
  1+20       0.0063      0.08  Q         |         |         |         |
  1+25       0.0069      0.08  Q         |         |         |         |
  1+30       0.0075      0.09  Q         |         |         |         |
  1+35       0.0081      0.09  Q         |         |         |         |
  1+40       0.0087      0.09  Q         |         |         |         |
  1+45       0.0093      0.09  Q         |         |         |         |
  1+50       0.0099      0.09  Q         |         |         |         |
  1+55       0.0105      0.09  Q         |         |         |         |
  2+ 0       0.0111      0.09  Q         |         |         |         |
  2+ 5       0.0118      0.09  Q         |         |         |         |
  2+10       0.0124      0.09  Q         |         |         |         |
  2+15       0.0130      0.09  QV        |         |         |         |
  2+20       0.0137      0.09  QV        |         |         |         |
  2+25       0.0143      0.09  QV        |         |         |         |
  2+30       0.0150      0.09  QV        |         |         |         |
  2+35       0.0156      0.09  QV        |         |         |         |
  2+40       0.0163      0.10  QV        |         |         |         |
  2+45       0.0169      0.10  QV        |         |         |         |
  2+50       0.0176      0.10  QV        |         |         |         |
  2+55       0.0183      0.10  QV        |         |         |         |
  3+ 0       0.0189      0.10  QV        |         |         |         |
  3+ 5       0.0196      0.10  QV        |         |         |         |
  3+10       0.0203      0.10  QV        |         |         |         |
  3+15       0.0210      0.10  QV        |         |         |         |
  3+20       0.0216      0.10  QV        |         |         |         |
  3+25       0.0223      0.10  QV        |         |         |         |
  3+30       0.0230      0.10  QV        |         |         |         |
  3+35       0.0237      0.10  QV        |         |         |         |
  3+40       0.0244      0.10  QV        |         |         |         |
  3+45       0.0250      0.10  QV        |         |         |         |
  3+50       0.0257      0.10  Q V       |         |         |         |
  3+55       0.0264      0.10  Q V       |         |         |         |
  4+ 0       0.0271      0.10  Q V       |         |         |         |
  4+ 5       0.0278      0.10  Q V       |         |         |         |
  4+10       0.0285      0.10  Q V       |         |         |         |
  4+15       0.0292      0.10  Q V       |         |         |         |
  4+20       0.0299      0.10  Q V       |         |         |         |
  4+25       0.0306      0.10  Q V       |         |         |         |
  4+30       0.0313      0.10  Q V       |         |         |         |
  4+35       0.0320      0.10  Q V       |         |         |         |
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 4+40      0.0327     0.10  Q V       |         |         |         |
 4+45      0.0334     0.10  Q V       |         |         |         |
 4+50      0.0341     0.10  Q V       |         |         |         |
 4+55      0.0349     0.10  Q V       |         |         |         |
 5+ 0      0.0356     0.10  Q V       |         |         |         |
 5+ 5      0.0363     0.10  Q V       |         |         |         |
 5+10      0.0370     0.10  Q V       |         |         |         |
 5+15      0.0377     0.11  Q V       |         |         |         |
 5+20      0.0385     0.11  Q  V      |         |         |         |
 5+25      0.0392     0.11  Q  V      |         |         |         |
 5+30      0.0399     0.11  Q  V      |         |         |         |
 5+35      0.0407     0.11  Q  V      |         |         |         |
 5+40      0.0414     0.11  Q  V      |         |         |         |
 5+45      0.0422     0.11  Q  V      |         |         |         |
 5+50      0.0429     0.11  Q  V      |         |         |         |
 5+55      0.0436     0.11  Q  V      |         |         |         |
 6+ 0      0.0444     0.11  Q  V      |         |         |         |
 6+ 5      0.0451     0.11  Q  V      |         |         |         |
 6+10      0.0459     0.11  Q  V      |         |         |         |
 6+15      0.0467     0.11  Q  V      |         |         |         |
 6+20      0.0474     0.11  Q  V      |         |         |         |
 6+25      0.0482     0.11  Q  V      |         |         |         |
 6+30      0.0489     0.11  Q  V      |         |         |         |
 6+35      0.0497     0.11  Q  V      |         |         |         |
 6+40      0.0505     0.11  Q  V      |         |         |         |
 6+45      0.0512     0.11  Q   V     |         |         |         |
 6+50      0.0520     0.11  Q   V     |         |         |         |
 6+55      0.0528     0.11  Q   V     |         |         |         |
 7+ 0      0.0536     0.11  Q   V     |         |         |         |
 7+ 5      0.0544     0.11  Q   V     |         |         |         |
 7+10      0.0552     0.11  Q   V     |         |         |         |
 7+15      0.0560     0.11  Q   V     |         |         |         |
 7+20      0.0567     0.12  Q   V     |         |         |         |
 7+25      0.0575     0.12  Q   V     |         |         |         |
 7+30      0.0583     0.12  Q   V     |         |         |         |
 7+35      0.0592     0.12  Q   V     |         |         |         |
 7+40      0.0600     0.12  Q   V     |         |         |         |
 7+45      0.0608     0.12  Q   V     |         |         |         |
 7+50      0.0616     0.12  Q   V     |         |         |         |
 7+55      0.0624     0.12  Q   V     |         |         |         |
 8+ 0      0.0632     0.12  Q    V    |         |         |         |
 8+ 5      0.0641     0.12  Q    V    |         |         |         |
 8+10      0.0649     0.12  Q    V    |         |         |         |
 8+15      0.0657     0.12  Q    V    |         |         |         |
 8+20      0.0666     0.12  Q    V    |         |         |         |
 8+25      0.0674     0.12  Q    V    |         |         |         |
 8+30      0.0682     0.12  Q    V    |         |         |         |
 8+35      0.0691     0.12  Q    V    |         |         |         |
 8+40      0.0699     0.12  Q    V    |         |         |         |
 8+45      0.0708     0.12  Q    V    |         |         |         |
 8+50      0.0717     0.13  Q    V    |         |         |         |
 8+55      0.0725     0.13  Q    V    |         |         |         |
 9+ 0      0.0734     0.13  Q    V    |         |         |         |
 9+ 5      0.0743     0.13  Q    V    |         |         |         |
 9+10      0.0751     0.13  Q    V    |         |         |         |
 9+15      0.0760     0.13  Q     V   |         |         |         |
 9+20      0.0769     0.13  Q     V   |         |         |         |
 9+25      0.0778     0.13  Q     V   |         |         |         |
 9+30      0.0787     0.13  Q     V   |         |         |         |
 9+35      0.0796     0.13  Q     V   |         |         |         |
 9+40      0.0805     0.13  Q     V   |         |         |         |
 9+45      0.0814     0.13  Q     V   |         |         |         |
 9+50      0.0823     0.13  Q     V   |         |         |         |
 9+55      0.0833     0.13  Q     V   |         |         |         |
10+ 0      0.0842     0.13  Q     V   |         |         |         |
10+ 5      0.0851     0.14  Q     V   |         |         |         |
10+10      0.0861     0.14  Q     V   |         |         |         |
10+15      0.0870     0.14  Q     V   |         |         |         |
10+20      0.0880     0.14  Q     V   |         |         |         |
10+25      0.0889     0.14  Q      V  |         |         |         |
10+30      0.0899     0.14  Q      V  |         |         |         |
10+35      0.0908     0.14  Q      V  |         |         |         |
10+40      0.0918     0.14  Q      V  |         |         |         |
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10+45       0.0928      0.14  Q      V  |         |         |         |
10+50       0.0938      0.14  Q      V  |         |         |         |
10+55       0.0948      0.14  Q      V  |         |         |         |
11+ 0       0.0958      0.15  Q      V  |         |         |         |
11+ 5       0.0968      0.15  Q      V  |         |         |         |
11+10       0.0978      0.15  Q      V  |         |         |         |
11+15       0.0988      0.15  Q      V  |         |         |         |
11+20       0.0998      0.15  Q      V  |         |         |         |
11+25       0.1009      0.15  Q      V  |         |         |         |
11+30       0.1019      0.15  Q       V |         |         |         |
11+35       0.1030      0.15  Q       V |         |         |         |
11+40       0.1040      0.15  Q       V |         |         |         |
11+45       0.1051      0.15  Q       V |         |         |         |
11+50       0.1062      0.16  Q       V |         |         |         |
11+55       0.1072      0.16  Q       V |         |         |         |
12+ 0       0.1083      0.16  Q       V |         |         |         |
12+ 5       0.1094      0.16  Q       V |         |         |         |
12+10       0.1105      0.16  Q       V |         |         |         |
12+15       0.1116      0.16  Q       V |         |         |         |
12+20       0.1126      0.15  Q       V |         |         |         |
12+25       0.1136      0.15  Q       V |         |         |         |
12+30       0.1146      0.14  Q        V|         |         |         |
12+35       0.1156      0.14  Q        V|         |         |         |
12+40       0.1166      0.14  Q        V|         |         |         |
12+45       0.1176      0.14  Q        V|         |         |         |
12+50       0.1186      0.14  Q        V|         |         |         |
12+55       0.1196      0.15  Q        V|         |         |         |
13+ 0       0.1206      0.15  Q        V|         |         |         |
13+ 5       0.1216      0.15  Q        V|         |         |         |
13+10       0.1227      0.15  Q        V|         |         |         |
13+15       0.1237      0.15  Q        V|         |         |         |
13+20       0.1247      0.15  Q        V|         |         |         |
13+25       0.1258      0.15  Q        V|         |         |         |
13+30       0.1269      0.16  Q         V         |         |         |
13+35       0.1280      0.16  Q         V         |         |         |
13+40       0.1291      0.16  Q         V         |         |         |
13+45       0.1302      0.16  Q         V         |         |         |
13+50       0.1314      0.17  Q         V         |         |         |
13+55       0.1325      0.17  Q         V         |         |         |
14+ 0       0.1337      0.17  Q         V         |         |         |
14+ 5       0.1349      0.17  Q         V         |         |         |
14+10       0.1361      0.18  Q         V         |         |         |
14+15       0.1374      0.18  Q         V         |         |         |
14+20       0.1387      0.19  Q         V         |         |         |
14+25       0.1400      0.19  Q         |V        |         |         |
14+30       0.1413      0.19  Q         |V        |         |         |
14+35       0.1427      0.20  Q         |V        |         |         |
14+40       0.1441      0.20  Q         |V        |         |         |
14+45       0.1455      0.21  Q         |V        |         |         |
14+50       0.1470      0.22  Q         |V        |         |         |
14+55       0.1485      0.22  Q         |V        |         |         |
15+ 0       0.1501      0.23  Q         |V        |         |         |
15+ 5       0.1517      0.24  Q         |V        |         |         |
15+10       0.1534      0.24  Q         | V       |         |         |
15+15       0.1552      0.25  |Q        | V       |         |         |
15+20       0.1570      0.27  |Q        | V       |         |         |
15+25       0.1589      0.28  |Q        | V       |         |         |
15+30       0.1609      0.29  |Q        | V       |         |         |
15+35       0.1630      0.30  |Q        | V       |         |         |
15+40       0.1652      0.32  |Q        |  V      |         |         |
15+45       0.1675      0.34  |Q        |  V      |         |         |
15+50       0.1700      0.36  |Q        |  V      |         |         |
15+55       0.1729      0.42  |Q        |  V      |         |         |
16+ 0       0.1769      0.58  | Q       |  V      |         |         |
16+ 5       0.1862      1.35  |    Q    |   V     |         |         |
16+10       0.2049      2.71  |         Q     V   |         |         |
16+15       0.2333      4.12  |         |     Q V |         |         |
16+20       0.2684      5.11  |         |         QV        |         |
16+25       0.3025      4.95  |         |        Q|  V      |         |
16+30       0.3272      3.59  |         |   Q     |    V    |         |
16+35       0.3442      2.47  |        Q|         |      V  |         |
16+40       0.3565      1.79  |      Q  |         |       V |         |
16+45       0.3663      1.42  |    Q    |         |       V |         |
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16+50       0.3747      1.22  |   Q     |         |        V|         |
16+55       0.3820      1.06  |   Q     |         |         V         |
17+ 0       0.3886      0.95  |  Q      |         |         V         |
17+ 5       0.3944      0.84  |  Q      |         |         |V        |
17+10       0.3995      0.74  | Q       |         |         |V        |
17+15       0.4041      0.68  | Q       |         |         |V        |
17+20       0.4085      0.64  | Q       |         |         | V       |
17+25       0.4123      0.55  | Q       |         |         | V       |
17+30       0.4159      0.52  | Q       |         |         | V       |
17+35       0.4190      0.46  |Q        |         |         |  V      |
17+40       0.4220      0.43  |Q        |         |         |  V      |
17+45       0.4248      0.41  |Q        |         |         |  V      |
17+50       0.4276      0.40  |Q        |         |         |  V      |
17+55       0.4301      0.37  |Q        |         |         |   V     |
18+ 0       0.4324      0.33  |Q        |         |         |   V     |
18+ 5       0.4346      0.32  |Q        |         |         |   V     |
18+10       0.4366      0.30  |Q        |         |         |   V     |
18+15       0.4386      0.29  |Q        |         |         |   V     |
18+20       0.4405      0.27  |Q        |         |         |   V     |
18+25       0.4423      0.26  |Q        |         |         |   V     |
18+30       0.4440      0.25  Q         |         |         |    V    |
18+35       0.4456      0.24  Q         |         |         |    V    |
18+40       0.4473      0.24  Q         |         |         |    V    |
18+45       0.4489      0.23  Q         |         |         |    V    |
18+50       0.4505      0.23  Q         |         |         |    V    |
18+55       0.4520      0.22  Q         |         |         |    V    |
19+ 0       0.4534      0.21  Q         |         |         |    V    |
19+ 5       0.4545      0.15  Q         |         |         |    V    |
19+10       0.4556      0.15  Q         |         |         |     V   |
19+15       0.4566      0.15  Q         |         |         |     V   |
19+20       0.4576      0.15  Q         |         |         |     V   |
19+25       0.4586      0.15  Q         |         |         |     V   |
19+30       0.4596      0.14  Q         |         |         |     V   |
19+35       0.4606      0.14  Q         |         |         |     V   |
19+40       0.4615      0.14  Q         |         |         |     V   |
19+45       0.4625      0.14  Q         |         |         |     V   |
19+50       0.4634      0.14  Q         |         |         |     V   |
19+55       0.4643      0.13  Q         |         |         |     V   |
20+ 0       0.4653      0.13  Q         |         |         |     V   |
20+ 5       0.4662      0.13  Q         |         |         |     V   |
20+10       0.4671      0.13  Q         |         |         |     V   |
20+15       0.4680      0.13  Q         |         |         |      V  |
20+20       0.4688      0.13  Q         |         |         |      V  |
20+25       0.4697      0.13  Q         |         |         |      V  |
20+30       0.4706      0.13  Q         |         |         |      V  |
20+35       0.4714      0.12  Q         |         |         |      V  |
20+40       0.4723      0.12  Q         |         |         |      V  |
20+45       0.4731      0.12  Q         |         |         |      V  |
20+50       0.4740      0.12  Q         |         |         |      V  |
20+55       0.4748      0.12  Q         |         |         |      V  |
21+ 0       0.4756      0.12  Q         |         |         |      V  |
21+ 5       0.4764      0.12  Q         |         |         |      V  |
21+10       0.4772      0.12  Q         |         |         |      V  |
21+15       0.4780      0.12  Q         |         |         |      V  |
21+20       0.4788      0.12  Q         |         |         |      V  |
21+25       0.4796      0.11  Q         |         |         |      V  |
21+30       0.4804      0.11  Q         |         |         |      V  |
21+35       0.4812      0.11  Q         |         |         |       V |
21+40       0.4819      0.11  Q         |         |         |       V |
21+45       0.4827      0.11  Q         |         |         |       V |
21+50       0.4835      0.11  Q         |         |         |       V |
21+55       0.4842      0.11  Q         |         |         |       V |
22+ 0       0.4850      0.11  Q         |         |         |       V |
22+ 5       0.4857      0.11  Q         |         |         |       V |
22+10       0.4864      0.11  Q         |         |         |       V |
22+15       0.4872      0.11  Q         |         |         |       V |
22+20       0.4879      0.11  Q         |         |         |       V |
22+25       0.4886      0.10  Q         |         |         |       V |
22+30       0.4893      0.10  Q         |         |         |       V |
22+35       0.4900      0.10  Q         |         |         |       V |
22+40       0.4908      0.10  Q         |         |         |       V |
22+45       0.4915      0.10  Q         |         |         |       V |
22+50       0.4922      0.10  Q         |         |         |       V |
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   22+55       0.4928      0.10  Q          |          |          |       V |
   23+ 0       0.4935      0.10  Q          |          |          |        V|
   23+ 5       0.4942      0.10  Q          |          |          |        V|
   23+10       0.4949      0.10  Q          |          |          |        V|
   23+15       0.4956      0.10  Q          |          |          |        V|
   23+20       0.4963      0.10  Q          |          |          |        V|
   23+25       0.4969      0.10  Q          |          |          |        V|
   23+30       0.4976      0.10  Q          |          |          |        V|
   23+35       0.4983      0.10  Q          |          |          |        V|
   23+40       0.4989      0.10  Q          |          |          |        V|
   23+45       0.4996      0.10  Q          |          |          |        V|
   23+50       0.5002      0.09  Q          |          |          |        V|
   23+55       0.5009      0.09  Q          |          |          |        V|
   24+ 0       0.5015      0.09  Q          |          |          |        V|
   24+ 5       0.5022      0.09  Q          |          |          |        V|
   24+10       0.5027      0.09  Q          |          |          |        V|
   24+15       0.5033      0.07  Q          |          |          |        V|
   24+20       0.5037      0.06  Q          |          |          |        V|
   24+25       0.5040      0.05  Q          |          |          |        V|
   24+30       0.5042      0.04  Q          |          |          |        V|
   24+35       0.5044      0.03  Q          |          |          |        V|
   24+40       0.5046      0.03  Q          |          |          |        V|
   24+45       0.5048      0.02  Q          |          |          |        V|
   24+50       0.5049      0.02  Q          |          |          |        V|
   24+55       0.5050      0.02  Q          |          |          |        V|
   25+ 0       0.5051      0.01  Q          |          |          |        V|
   25+ 5       0.5052      0.01  Q          |          |          |        V|
   25+10       0.5053      0.01  Q          |          |          |        V|
   25+15       0.5053      0.01  Q          |          |          |        V|
   25+20       0.5054      0.01  Q          |          |          |        V|
   25+25       0.5055      0.01  Q          |          |          |        V|
   25+30       0.5055      0.01  Q          |          |          |        V|
   25+35       0.5055      0.01  Q          |          |          |        V|
   25+40       0.5056      0.01  Q          |          |          |        V|
   25+45       0.5056      0.00  Q          |          |          |        V|
   25+50       0.5057      0.00  Q          |          |          |        V|
   25+55       0.5057      0.00  Q          |          |          |        V|
   26+ 0       0.5057      0.00  Q          |          |          |        V|
   26+ 5       0.5057      0.00  Q          |          |          |        V|
   26+10       0.5057      0.00  Q          |          |          |        V|
   26+15       0.5057      0.00  Q          |          |          |        V|
   26+20       0.5058      0.00  Q          |          |          |        V|
   26+25       0.5058      0.00  Q          |          |          |        V|
   26+30       0.5058      0.00  Q          |          |          |        V|
   26+35       0.5058      0.00  Q          |          |          |        V|
   26+40       0.5058      0.00  Q          |          |          |        V|
   26+45       0.5058      0.00  Q          |          |          |        V|
   26+50       0.5058      0.00  Q          |          |          |        V|
   26+55       0.5058      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

        Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018, Version 9.0

                Study date  03/22/21


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
------------------------------------------------------------------------

San Bernardino County Synthetic Unit Hydrology Method
                Manual date - August 1986


Program License Serial Number 6320

---------------------------------------------------------------------
204828 - TEC EQUIPMENT 776 MILL ST
EXISITNG CONDITIONS
100-YEAR, 24-HOUR STORM
BY: JTS  DATE: 03-22-21
--------------------------------------------------------------------

        Storm Event Year = 100

        Antecedent Moisture Condition = 3

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format




Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 10
             7.01           1           0.83
--------------------------------------------------------------------
Rainfall data for year 2
             7.01           6           1.41
--------------------------------------------------------------------
Rainfall data for year 2
             7.01          24           2.40
--------------------------------------------------------------------
Rainfall data for year 100
             7.01           1           1.28
--------------------------------------------------------------------
Rainfall data for year 100
             7.01           6           2.60
--------------------------------------------------------------------
Rainfall data for year 100
             7.01          24           5.90
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 50.0      70.0          7.01      1.000     0.532    1.000    0.532

Area-averaged adjusted loss rate Fm (In/Hr) =  0.532

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC3)           Yield Fr
```

```
     7.01   1.000         50.0      70.0       4.29     0.462

Area-averaged catchment yield fraction, Y =  0.462
Area-averaged low loss fraction, Yb =  0.538
User entry of time of concentration  =   0.460 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       7.01(Ac.)
Catchment Lag time =   0.368 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 22.6449
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.532(In/Hr)
Average low loss rate fraction (Yb) = 0.538 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.474(In)
Computed peak 30-minute rainfall =  0.970(In)
Specified peak 1-hour rainfall =  1.280(In)
Computed peak 3-hour rainfall =  1.977(In)
Specified peak 6-hour rainfall =  2.600(In)
Specified peak 24-hour rainfall =  5.900(In)


Rainfall depth area reduction factors:
Using a total area of       7.01(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.474(In)
30-minute factor = 1.000    Adjusted rainfall =  0.970(In)
1-hour factor = 1.000       Adjusted rainfall =  1.280(In)
3-hour factor = 1.000       Adjusted rainfall =  1.976(In)
6-hour factor = 1.000       Adjusted rainfall =  2.600(In)
24-hour factor = 1.000      Adjusted rainfall =  5.900(In)
---------------------------------------------------------------------

                        U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph         Unit Hydrograph
Number            Mean values            ((CFS))
---------------------------------------------------------------------
                (K =       84.78 (CFS))

  1                2.049                 1.737
  2                8.477                 5.450
  3               19.785                 9.587
  4               35.087                12.972
  5               50.623                13.171
  6               61.571                 9.282
  7               68.622                 5.977
  8               73.370                 4.025
  9               76.878                 2.974
 10               79.814                 2.489
 11               82.277                 2.088
 12               84.416                 1.814
 13               86.277                 1.577
 14               87.834                 1.320
 15               89.201                 1.159
 16               90.506                 1.106
 17               91.540                 0.877
 18               92.521                 0.832
 19               93.306                 0.665
 20               94.030                 0.614
 21               94.727                 0.591
 22               95.406                 0.576
 23               96.009                 0.511
 24               96.507                 0.423
 25               96.983                 0.403
 26               97.394                 0.349
 27               97.790                 0.336
 28               98.118                 0.278
 29               98.431                 0.265
 30               98.680                 0.211
 31               98.907                 0.192
 32               99.133                 0.192
 33               99.360                 0.192
```

```
 34               99.586                   0.192
 35               99.812                   0.192
 36              100.000                   0.159
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number              (In)                (In)
  1              0.4736              0.4736
  2              0.6249              0.1513
  3              0.7349              0.1100
  4              0.8246              0.0896
  5              0.9015              0.0770
  6              0.9697              0.0682
  7              1.0314              0.0617
  8              1.0880              0.0566
  9              1.1405              0.0525
 10              1.1896              0.0491
 11              1.2358              0.0462
 12              1.2796              0.0438
 13              1.3208              0.0412
 14              1.3601              0.0393
 15              1.3977              0.0376
 16              1.4339              0.0362
 17              1.4687              0.0348
 18              1.5023              0.0336
 19              1.5348              0.0325
 20              1.5663              0.0315
 21              1.5968              0.0305
 22              1.6265              0.0297
 23              1.6554              0.0289
 24              1.6835              0.0281
 25              1.7109              0.0274
 26              1.7377              0.0268
 27              1.7638              0.0261
 28              1.7894              0.0256
 29              1.8144              0.0250
 30              1.8389              0.0245
 31              1.8629              0.0240
 32              1.8865              0.0236
 33              1.9096              0.0231
 34              1.9323              0.0227
 35              1.9546              0.0223
 36              1.9765              0.0219
 37              1.9980              0.0215
 38              2.0192              0.0212
 39              2.0401              0.0209
 40              2.0606              0.0205
 41              2.0808              0.0202
 42              2.1008              0.0199
 43              2.1204              0.0196
 44              2.1398              0.0194
 45              2.1589              0.0191
 46              2.1777              0.0188
 47              2.1963              0.0186
 48              2.2147              0.0184
 49              2.2328              0.0181
 50              2.2507              0.0179
 51              2.2684              0.0177
 52              2.2859              0.0175
 53              2.3032              0.0173
 54              2.3203              0.0171
 55              2.3372              0.0169
 56              2.3539              0.0167
 57              2.3705              0.0165
 58              2.3868              0.0164
 59              2.4030              0.0162
 60              2.4191              0.0160
 61              2.4349              0.0159
 62              2.4506              0.0157
 63              2.4662              0.0156
 64              2.4816              0.0154
 65              2.4969              0.0153
 66              2.5120              0.0151
 67              2.5270              0.0150
```

68	2.5418	0.0149
69	2.5565	0.0147
70	2.5711	0.0146
71	2.5856	0.0145
72	2.5999	0.0143
73	2.6212	0.0213
74	2.6424	0.0212
75	2.6634	0.0210
76	2.6844	0.0209
77	2.7052	0.0208
78	2.7259	0.0207
79	2.7465	0.0206
80	2.7670	0.0205
81	2.7874	0.0204
82	2.8077	0.0203
83	2.8279	0.0202
84	2.8480	0.0201
85	2.8680	0.0200
86	2.8879	0.0199
87	2.9077	0.0198
88	2.9274	0.0197
89	2.9470	0.0196
90	2.9665	0.0195
91	2.9860	0.0194
92	3.0053	0.0194
93	3.0246	0.0193
94	3.0438	0.0192
95	3.0629	0.0191
96	3.0819	0.0190
97	3.1008	0.0189
98	3.1197	0.0189
99	3.1385	0.0188
100	3.1572	0.0187
101	3.1758	0.0186
102	3.1943	0.0185
103	3.2128	0.0185
104	3.2312	0.0184
105	3.2495	0.0183
106	3.2678	0.0183
107	3.2860	0.0182
108	3.3041	0.0181
109	3.3222	0.0181
110	3.3401	0.0180
111	3.3580	0.0179
112	3.3759	0.0178
113	3.3937	0.0178
114	3.4114	0.0177
115	3.4291	0.0177
116	3.4467	0.0176
117	3.4642	0.0175
118	3.4817	0.0175
119	3.4991	0.0174
120	3.5164	0.0174
121	3.5337	0.0173
122	3.5509	0.0172
123	3.5681	0.0172
124	3.5852	0.0171
125	3.6023	0.0171
126	3.6193	0.0170
127	3.6363	0.0170
128	3.6532	0.0169
129	3.6700	0.0168
130	3.6868	0.0168
131	3.7035	0.0167
132	3.7202	0.0167
133	3.7369	0.0166
134	3.7534	0.0166
135	3.7700	0.0165
136	3.7865	0.0165
137	3.8029	0.0164
138	3.8193	0.0164
139	3.8356	0.0163
140	3.8519	0.0163

141	3.8681	0.0162
142	3.8843	0.0162
143	3.9005	0.0161
144	3.9166	0.0161
145	3.9326	0.0161
146	3.9486	0.0160
147	3.9646	0.0160
148	3.9805	0.0159
149	3.9964	0.0159
150	4.0122	0.0158
151	4.0280	0.0158
152	4.0438	0.0157
153	4.0595	0.0157
154	4.0751	0.0157
155	4.0908	0.0156
156	4.1063	0.0156
157	4.1219	0.0155
158	4.1374	0.0155
159	4.1528	0.0155
160	4.1683	0.0154
161	4.1836	0.0154
162	4.1990	0.0153
163	4.2143	0.0153
164	4.2295	0.0153
165	4.2448	0.0152
166	4.2600	0.0152
167	4.2751	0.0152
168	4.2902	0.0151
169	4.3053	0.0151
170	4.3203	0.0150
171	4.3353	0.0150
172	4.3503	0.0150
173	4.3652	0.0149
174	4.3801	0.0149
175	4.3950	0.0149
176	4.4098	0.0148
177	4.4246	0.0148
178	4.4394	0.0148
179	4.4541	0.0147
180	4.4688	0.0147
181	4.4835	0.0147
182	4.4981	0.0146
183	4.5127	0.0146
184	4.5272	0.0146
185	4.5418	0.0145
186	4.5563	0.0145
187	4.5707	0.0145
188	4.5852	0.0144
189	4.5996	0.0144
190	4.6139	0.0144
191	4.6283	0.0143
192	4.6426	0.0143
193	4.6569	0.0143
194	4.6711	0.0142
195	4.6853	0.0142
196	4.6995	0.0142
197	4.7137	0.0142
198	4.7278	0.0141
199	4.7419	0.0141
200	4.7560	0.0141
201	4.7700	0.0140
202	4.7840	0.0140
203	4.7980	0.0140
204	4.8120	0.0140
205	4.8259	0.0139
206	4.8398	0.0139
207	4.8537	0.0139
208	4.8675	0.0138
209	4.8813	0.0138
210	4.8951	0.0138
211	4.9089	0.0138
212	4.9226	0.0137
213	4.9363	0.0137

214	4.9500	0.0137
215	4.9637	0.0137
216	4.9773	0.0136
217	4.9909	0.0136
218	5.0045	0.0136
219	5.0181	0.0136
220	5.0316	0.0135
221	5.0451	0.0135
222	5.0586	0.0135
223	5.0720	0.0135
224	5.0855	0.0134
225	5.0989	0.0134
226	5.1123	0.0134
227	5.1256	0.0134
228	5.1390	0.0133
229	5.1523	0.0133
230	5.1656	0.0133
231	5.1788	0.0133
232	5.1921	0.0132
233	5.2053	0.0132
234	5.2185	0.0132
235	5.2316	0.0132
236	5.2448	0.0131
237	5.2579	0.0131
238	5.2710	0.0131
239	5.2841	0.0131
240	5.2972	0.0131
241	5.3102	0.0130
242	5.3232	0.0130
243	5.3362	0.0130
244	5.3492	0.0130
245	5.3621	0.0129
246	5.3750	0.0129
247	5.3880	0.0129
248	5.4008	0.0129
249	5.4137	0.0129
250	5.4265	0.0128
251	5.4394	0.0128
252	5.4522	0.0128
253	5.4649	0.0128
254	5.4777	0.0128
255	5.4904	0.0127
256	5.5032	0.0127
257	5.5158	0.0127
258	5.5285	0.0127
259	5.5412	0.0127
260	5.5538	0.0126
261	5.5664	0.0126
262	5.5790	0.0126
263	5.5916	0.0126
264	5.6042	0.0126
265	5.6167	0.0125
266	5.6292	0.0125
267	5.6417	0.0125
268	5.6542	0.0125
269	5.6667	0.0125
270	5.6791	0.0124
271	5.6915	0.0124
272	5.7039	0.0124
273	5.7163	0.0124
274	5.7287	0.0124
275	5.7410	0.0123
276	5.7534	0.0123
277	5.7657	0.0123
278	5.7780	0.0123
279	5.7903	0.0123
280	5.8025	0.0123
281	5.8148	0.0122
282	5.8270	0.0122
283	5.8392	0.0122
284	5.8514	0.0122
285	5.8635	0.0122
286	5.8757	0.0122

```
287              5.8878               0.0121
288              5.8999               0.0121
---------------------------------------------------------------------
Unit              Unit            Unit              Effective
Period            Rainfall        Soil-Loss         Rainfall
(number)            (In)          (In)                 (In)
---------------------------------------------------------------------
  1              0.0121           0.0065              0.0056
  2              0.0121           0.0065              0.0056
  3              0.0122           0.0065              0.0056
  4              0.0122           0.0066              0.0056
  5              0.0122           0.0066              0.0056
  6              0.0122           0.0066              0.0057
  7              0.0123           0.0066              0.0057
  8              0.0123           0.0066              0.0057
  9              0.0123           0.0066              0.0057
 10              0.0123           0.0066              0.0057
 11              0.0124           0.0067              0.0057
 12              0.0124           0.0067              0.0057
 13              0.0124           0.0067              0.0057
 14              0.0125           0.0067              0.0058
 15              0.0125           0.0067              0.0058
 16              0.0125           0.0067              0.0058
 17              0.0126           0.0068              0.0058
 18              0.0126           0.0068              0.0058
 19              0.0126           0.0068              0.0058
 20              0.0126           0.0068              0.0058
 21              0.0127           0.0068              0.0059
 22              0.0127           0.0068              0.0059
 23              0.0127           0.0069              0.0059
 24              0.0128           0.0069              0.0059
 25              0.0128           0.0069              0.0059
 26              0.0128           0.0069              0.0059
 27              0.0129           0.0069              0.0059
 28              0.0129           0.0069              0.0060
 29              0.0129           0.0070              0.0060
 30              0.0129           0.0070              0.0060
 31              0.0130           0.0070              0.0060
 32              0.0130           0.0070              0.0060
 33              0.0131           0.0070              0.0060
 34              0.0131           0.0070              0.0060
 35              0.0131           0.0071              0.0061
 36              0.0131           0.0071              0.0061
 37              0.0132           0.0071              0.0061
 38              0.0132           0.0071              0.0061
 39              0.0133           0.0071              0.0061
 40              0.0133           0.0071              0.0061
 41              0.0133           0.0072              0.0062
 42              0.0134           0.0072              0.0062
 43              0.0134           0.0072              0.0062
 44              0.0134           0.0072              0.0062
 45              0.0135           0.0073              0.0062
 46              0.0135           0.0073              0.0062
 47              0.0136           0.0073              0.0063
 48              0.0136           0.0073              0.0063
 49              0.0136           0.0073              0.0063
 50              0.0137           0.0073              0.0063
 51              0.0137           0.0074              0.0063
 52              0.0137           0.0074              0.0063
 53              0.0138           0.0074              0.0064
 54              0.0138           0.0074              0.0064
 55              0.0139           0.0075              0.0064
 56              0.0139           0.0075              0.0064
 57              0.0140           0.0075              0.0064
 58              0.0140           0.0075              0.0065
 59              0.0140           0.0076              0.0065
 60              0.0141           0.0076              0.0065
 61              0.0141           0.0076              0.0065
 62              0.0142           0.0076              0.0065
 63              0.0142           0.0076              0.0066
 64              0.0142           0.0077              0.0066
 65              0.0143           0.0077              0.0066
 66              0.0143           0.0077              0.0066
```

67	0.0144	0.0077	0.0067
68	0.0144	0.0078	0.0067
69	0.0145	0.0078	0.0067
70	0.0145	0.0078	0.0067
71	0.0146	0.0079	0.0067
72	0.0146	0.0079	0.0068
73	0.0147	0.0079	0.0068
74	0.0147	0.0079	0.0068
75	0.0148	0.0080	0.0068
76	0.0148	0.0080	0.0069
77	0.0149	0.0080	0.0069
78	0.0149	0.0080	0.0069
79	0.0150	0.0081	0.0069
80	0.0150	0.0081	0.0069
81	0.0151	0.0081	0.0070
82	0.0152	0.0082	0.0070
83	0.0152	0.0082	0.0070
84	0.0153	0.0082	0.0071
85	0.0153	0.0083	0.0071
86	0.0154	0.0083	0.0071
87	0.0155	0.0083	0.0071
88	0.0155	0.0083	0.0072
89	0.0156	0.0084	0.0072
90	0.0156	0.0084	0.0072
91	0.0157	0.0084	0.0073
92	0.0157	0.0085	0.0073
93	0.0158	0.0085	0.0073
94	0.0159	0.0085	0.0073
95	0.0160	0.0086	0.0074
96	0.0160	0.0086	0.0074
97	0.0161	0.0087	0.0074
98	0.0161	0.0087	0.0075
99	0.0162	0.0087	0.0075
100	0.0163	0.0088	0.0075
101	0.0164	0.0088	0.0076
102	0.0164	0.0088	0.0076
103	0.0165	0.0089	0.0076
104	0.0166	0.0089	0.0077
105	0.0167	0.0090	0.0077
106	0.0167	0.0090	0.0077
107	0.0168	0.0091	0.0078
108	0.0169	0.0091	0.0078
109	0.0170	0.0091	0.0079
110	0.0171	0.0092	0.0079
111	0.0172	0.0092	0.0079
112	0.0172	0.0093	0.0080
113	0.0174	0.0093	0.0080
114	0.0174	0.0094	0.0080
115	0.0175	0.0094	0.0081
116	0.0176	0.0095	0.0081
117	0.0177	0.0095	0.0082
118	0.0178	0.0096	0.0082
119	0.0179	0.0096	0.0083
120	0.0180	0.0097	0.0083
121	0.0181	0.0097	0.0084
122	0.0182	0.0098	0.0084
123	0.0183	0.0099	0.0085
124	0.0184	0.0099	0.0085
125	0.0185	0.0100	0.0086
126	0.0186	0.0100	0.0086
127	0.0188	0.0101	0.0087
128	0.0189	0.0101	0.0087
129	0.0190	0.0102	0.0088
130	0.0191	0.0103	0.0088
131	0.0193	0.0104	0.0089
132	0.0194	0.0104	0.0089
133	0.0195	0.0105	0.0090
134	0.0196	0.0106	0.0091
135	0.0198	0.0107	0.0091
136	0.0199	0.0107	0.0092
137	0.0201	0.0108	0.0093
138	0.0202	0.0109	0.0093
139	0.0204	0.0110	0.0094

140	0.0205	0.0110	0.0095
141	0.0207	0.0111	0.0096
142	0.0208	0.0112	0.0096
143	0.0210	0.0113	0.0097
144	0.0212	0.0114	0.0098
145	0.0143	0.0077	0.0066
146	0.0145	0.0078	0.0067
147	0.0147	0.0079	0.0068
148	0.0149	0.0080	0.0069
149	0.0151	0.0081	0.0070
150	0.0153	0.0082	0.0071
151	0.0156	0.0084	0.0072
152	0.0157	0.0085	0.0073
153	0.0160	0.0086	0.0074
154	0.0162	0.0087	0.0075
155	0.0165	0.0089	0.0076
156	0.0167	0.0090	0.0077
157	0.0171	0.0092	0.0079
158	0.0173	0.0093	0.0080
159	0.0177	0.0095	0.0082
160	0.0179	0.0096	0.0083
161	0.0184	0.0099	0.0085
162	0.0186	0.0100	0.0086
163	0.0191	0.0103	0.0088
164	0.0194	0.0104	0.0089
165	0.0199	0.0107	0.0092
166	0.0202	0.0109	0.0093
167	0.0209	0.0112	0.0096
168	0.0212	0.0114	0.0098
169	0.0219	0.0118	0.0101
170	0.0223	0.0120	0.0103
171	0.0231	0.0124	0.0107
172	0.0236	0.0127	0.0109
173	0.0245	0.0132	0.0113
174	0.0250	0.0135	0.0116
175	0.0261	0.0141	0.0121
176	0.0268	0.0144	0.0124
177	0.0281	0.0151	0.0130
178	0.0289	0.0155	0.0133
179	0.0305	0.0164	0.0141
180	0.0315	0.0169	0.0145
181	0.0336	0.0181	0.0155
182	0.0348	0.0187	0.0161
183	0.0376	0.0203	0.0174
184	0.0393	0.0211	0.0182
185	0.0438	0.0235	0.0202
186	0.0462	0.0249	0.0214
187	0.0525	0.0282	0.0243
188	0.0566	0.0304	0.0261
189	0.0682	0.0367	0.0315
190	0.0770	0.0414	0.0356
191	0.1100	0.0444	0.0657
192	0.1513	0.0444	0.1069
193	0.4736	0.0444	0.4292
194	0.0896	0.0444	0.0453
195	0.0617	0.0332	0.0285
196	0.0491	0.0264	0.0227
197	0.0412	0.0222	0.0190
198	0.0362	0.0195	0.0167
199	0.0325	0.0175	0.0150
200	0.0297	0.0160	0.0137
201	0.0274	0.0148	0.0127
202	0.0256	0.0138	0.0118
203	0.0240	0.0129	0.0111
204	0.0227	0.0122	0.0105
205	0.0215	0.0116	0.0100
206	0.0205	0.0110	0.0095
207	0.0196	0.0106	0.0091
208	0.0188	0.0101	0.0087
209	0.0181	0.0098	0.0084
210	0.0175	0.0094	0.0081
211	0.0169	0.0091	0.0078
212	0.0164	0.0088	0.0076

213	0.0159	0.0085	0.0073
214	0.0154	0.0083	0.0071
215	0.0150	0.0081	0.0069
216	0.0146	0.0078	0.0067
217	0.0213	0.0115	0.0098
218	0.0209	0.0113	0.0097
219	0.0206	0.0111	0.0095
220	0.0203	0.0109	0.0094
221	0.0200	0.0108	0.0092
222	0.0197	0.0106	0.0091
223	0.0194	0.0105	0.0090
224	0.0192	0.0103	0.0089
225	0.0189	0.0102	0.0087
226	0.0187	0.0101	0.0086
227	0.0185	0.0099	0.0085
228	0.0183	0.0098	0.0084
229	0.0181	0.0097	0.0083
230	0.0178	0.0096	0.0082
231	0.0177	0.0095	0.0082
232	0.0175	0.0094	0.0081
233	0.0173	0.0093	0.0080
234	0.0171	0.0092	0.0079
235	0.0170	0.0091	0.0078
236	0.0168	0.0090	0.0078
237	0.0166	0.0089	0.0077
238	0.0165	0.0089	0.0076
239	0.0163	0.0088	0.0075
240	0.0162	0.0087	0.0075
241	0.0161	0.0086	0.0074
242	0.0159	0.0086	0.0074
243	0.0158	0.0085	0.0073
244	0.0157	0.0084	0.0072
245	0.0155	0.0084	0.0072
246	0.0154	0.0083	0.0071
247	0.0153	0.0082	0.0071
248	0.0152	0.0082	0.0070
249	0.0151	0.0081	0.0070
250	0.0150	0.0081	0.0069
251	0.0149	0.0080	0.0069
252	0.0148	0.0079	0.0068
253	0.0147	0.0079	0.0068
254	0.0146	0.0078	0.0067
255	0.0145	0.0078	0.0067
256	0.0144	0.0077	0.0066
257	0.0143	0.0077	0.0066
258	0.0142	0.0076	0.0066
259	0.0141	0.0076	0.0065
260	0.0140	0.0075	0.0065
261	0.0139	0.0075	0.0064
262	0.0138	0.0074	0.0064
263	0.0138	0.0074	0.0064
264	0.0137	0.0074	0.0063
265	0.0136	0.0073	0.0063
266	0.0135	0.0073	0.0063
267	0.0135	0.0072	0.0062
268	0.0134	0.0072	0.0062
269	0.0133	0.0072	0.0062
270	0.0132	0.0071	0.0061
271	0.0132	0.0071	0.0061
272	0.0131	0.0070	0.0061
273	0.0130	0.0070	0.0060
274	0.0130	0.0070	0.0060
275	0.0129	0.0069	0.0060
276	0.0128	0.0069	0.0059
277	0.0128	0.0069	0.0059
278	0.0127	0.0068	0.0059
279	0.0127	0.0068	0.0058
280	0.0126	0.0068	0.0058
281	0.0125	0.0067	0.0058
282	0.0125	0.0067	0.0058
283	0.0124	0.0067	0.0057
284	0.0124	0.0067	0.0057
285	0.0123	0.0066	0.0057

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      286              0.0123           0.0066              0.0057
      287              0.0122           0.0066              0.0056
      288              0.0122           0.0065              0.0056
      --------------------------------------------------------------------
      --------------------------------------------------------------------
      Total soil rain loss =      2.91(In)
      Total effective rainfall =      2.99(In)
      Peak flow rate in flood hydrograph =      8.96(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
-----------------------------------------------------------------------
  0+ 5       0.0001      0.01  Q         |         |         |         |
  0+10       0.0003      0.04  Q         |         |         |         |
  0+15       0.0010      0.09  Q         |         |         |         |
  0+20       0.0021      0.17  Q         |         |         |         |
  0+25       0.0038      0.24  Q         |         |         |         |
  0+30       0.0058      0.29  VQ        |         |         |         |
  0+35       0.0081      0.33  VQ        |         |         |         |
  0+40       0.0105      0.35  VQ        |         |         |         |
  0+45       0.0130      0.37  VQ        |         |         |         |
  0+50       0.0157      0.38  VQ        |         |         |         |
  0+55       0.0184      0.40  VQ        |         |         |         |
  1+ 0       0.0212      0.41  VQ        |         |         |         |
  1+ 5       0.0240      0.42  VQ        |         |         |         |
  1+10       0.0270      0.42  VQ        |         |         |         |
  1+15       0.0299      0.43  VQ        |         |         |         |
  1+20       0.0330      0.44  VQ        |         |         |         |
  1+25       0.0360      0.44  VQ        |         |         |         |
  1+30       0.0391      0.45  VQ        |         |         |         |
  1+35       0.0423      0.46  VQ        |         |         |         |
  1+40       0.0454      0.46  |Q        |         |         |         |
  1+45       0.0486      0.46  |Q        |         |         |         |
  1+50       0.0519      0.47  |Q        |         |         |         |
  1+55       0.0551      0.47  |Q        |         |         |         |
  2+ 0       0.0584      0.48  |Q        |         |         |         |
  2+ 5       0.0617      0.48  |Q        |         |         |         |
  2+10       0.0650      0.48  |Q        |         |         |         |
  2+15       0.0684      0.49  |Q        |         |         |         |
  2+20       0.0717      0.49  |Q        |         |         |         |
  2+25       0.0751      0.49  |Q        |         |         |         |
  2+30       0.0785      0.49  |Q        |         |         |         |
  2+35       0.0819      0.50  |Q        |         |         |         |
  2+40       0.0853      0.50  |Q        |         |         |         |
  2+45       0.0888      0.50  |QV       |         |         |         |
  2+50       0.0922      0.50  | Q       |         |         |         |
  2+55       0.0957      0.50  | Q       |         |         |         |
  3+ 0       0.0992      0.51  | Q       |         |         |         |
  3+ 5       0.1027      0.51  | Q       |         |         |         |
  3+10       0.1062      0.51  | Q       |         |         |         |
  3+15       0.1097      0.51  | Q       |         |         |         |
  3+20       0.1133      0.51  | Q       |         |         |         |
  3+25       0.1168      0.51  | Q       |         |         |         |
  3+30       0.1203      0.51  | Q       |         |         |         |
  3+35       0.1239      0.52  | Q       |         |         |         |
  3+40       0.1274      0.52  | Q       |         |         |         |
  3+45       0.1310      0.52  | Q       |         |         |         |
  3+50       0.1346      0.52  | QV      |         |         |         |
  3+55       0.1382      0.52  | QV      |         |         |         |
  4+ 0       0.1418      0.52  | QV      |         |         |         |
  4+ 5       0.1454      0.52  | QV      |         |         |         |
  4+10       0.1490      0.53  | QV      |         |         |         |
  4+15       0.1527      0.53  | QV      |         |         |         |
  4+20       0.1563      0.53  | QV      |         |         |         |
  4+25       0.1599      0.53  | QV      |         |         |         |
  4+30       0.1636      0.53  | QV      |         |         |         |
  4+35       0.1673      0.53  | QV      |         |         |         |
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 4+40       0.1710      0.53  |QV      |         |         |         |
 4+45       0.1747      0.54  |QV      |         |         |         |
 4+50       0.1784      0.54  |Q V     |         |         |         |
 4+55       0.1821      0.54  |Q V     |         |         |         |
 5+ 0       0.1858      0.54  |Q V     |         |         |         |
 5+ 5       0.1895      0.54  |Q V     |         |         |         |
 5+10       0.1933      0.54  |Q V     |         |         |         |
 5+15       0.1970      0.55  |Q V     |         |         |         |
 5+20       0.2008      0.55  |Q V     |         |         |         |
 5+25       0.2046      0.55  |Q V     |         |         |         |
 5+30       0.2084      0.55  |Q V     |         |         |         |
 5+35       0.2122      0.55  |Q V     |         |         |         |
 5+40       0.2160      0.55  |Q V     |         |         |         |
 5+45       0.2198      0.56  |Q  V    |         |         |         |
 5+50       0.2237      0.56  |Q  V    |         |         |         |
 5+55       0.2275      0.56  |Q  V    |         |         |         |
 6+ 0       0.2314      0.56  |Q  V    |         |         |         |
 6+ 5       0.2353      0.56  |Q  V    |         |         |         |
 6+10       0.2392      0.56  |Q  V    |         |         |         |
 6+15       0.2431      0.57  |Q  V    |         |         |         |
 6+20       0.2470      0.57  |Q  V    |         |         |         |
 6+25       0.2509      0.57  |Q  V    |         |         |         |
 6+30       0.2548      0.57  |Q  V    |         |         |         |
 6+35       0.2588      0.57  |Q  V    |         |         |         |
 6+40       0.2628      0.58  |Q   V   |         |         |         |
 6+45       0.2668      0.58  |Q   V   |         |         |         |
 6+50       0.2707      0.58  |Q   V   |         |         |         |
 6+55       0.2748      0.58  |Q   V   |         |         |         |
 7+ 0       0.2788      0.58  |Q   V   |         |         |         |
 7+ 5       0.2828      0.59  |Q   V   |         |         |         |
 7+10       0.2869      0.59  |Q   V   |         |         |         |
 7+15       0.2909      0.59  |Q   V   |         |         |         |
 7+20       0.2950      0.59  |Q   V   |         |         |         |
 7+25       0.2991      0.60  |Q   V   |         |         |         |
 7+30       0.3032      0.60  |Q   V   |         |         |         |
 7+35       0.3074      0.60  |Q    V  |         |         |         |
 7+40       0.3115      0.60  |Q    V  |         |         |         |
 7+45       0.3157      0.60  |Q    V  |         |         |         |
 7+50       0.3199      0.61  |Q    V  |         |         |         |
 7+55       0.3240      0.61  |Q    V  |         |         |         |
 8+ 0       0.3283      0.61  |Q    V  |         |         |         |
 8+ 5       0.3325      0.61  |Q    V  |         |         |         |
 8+10       0.3367      0.62  |Q    V  |         |         |         |
 8+15       0.3410      0.62  |Q    V  |         |         |         |
 8+20       0.3453      0.62  |Q    V  |         |         |         |
 8+25       0.3496      0.62  |Q     V |         |         |         |
 8+30       0.3539      0.63  |Q     V |         |         |         |
 8+35       0.3582      0.63  |Q     V |         |         |         |
 8+40       0.3626      0.63  |Q     V |         |         |         |
 8+45       0.3669      0.63  |Q     V |         |         |         |
 8+50       0.3713      0.64  |Q     V |         |         |         |
 8+55       0.3757      0.64  |Q     V |         |         |         |
 9+ 0       0.3802      0.64  |Q     V |         |         |         |
 9+ 5       0.3846      0.65  |Q     V |         |         |         |
 9+10       0.3891      0.65  |Q     V |         |         |         |
 9+15       0.3936      0.65  |Q      V|         |         |         |
 9+20       0.3981      0.66  |Q      V|         |         |         |
 9+25       0.4026      0.66  |Q      V|         |         |         |
 9+30       0.4072      0.66  |Q      V|         |         |         |
 9+35       0.4117      0.66  |Q      V|         |         |         |
 9+40       0.4163      0.67  |Q      V|         |         |         |
 9+45       0.4210      0.67  |Q      V|         |         |         |
 9+50       0.4256      0.67  |Q      V|         |         |         |
 9+55       0.4303      0.68  |Q      V|         |         |         |
10+ 0       0.4350      0.68  |Q      V|         |         |         |
10+ 5       0.4397      0.68  |Q       V         |         |         |
10+10       0.4444      0.69  |Q       V         |         |         |
10+15       0.4492      0.69  |Q       V         |         |         |
10+20       0.4540      0.70  |Q       V         |         |         |
10+25       0.4588      0.70  |Q       V         |         |         |
10+30       0.4637      0.70  |Q       V         |         |         |
10+35       0.4685      0.71  |Q       V         |         |         |
10+40       0.4734      0.71  |Q       V         |         |         |
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10+45       0.4784      0.72  | Q       V         |         |         |
10+50       0.4833      0.72  | Q       |V        |         |         |
10+55       0.4883      0.72  | Q       |V        |         |         |
11+ 0       0.4933      0.73  | Q       |V        |         |         |
11+ 5       0.4984      0.73  | Q       |V        |         |         |
11+10       0.5035      0.74  | Q       |V        |         |         |
11+15       0.5086      0.74  | Q       |V        |         |         |
11+20       0.5137      0.75  | Q       |V        |         |         |
11+25       0.5189      0.75  |  Q      |V        |         |         |
11+30       0.5241      0.76  |  Q      | V       |         |         |
11+35       0.5294      0.76  |  Q      | V       |         |         |
11+40       0.5347      0.77  |  Q      | V       |         |         |
11+45       0.5400      0.77  |  Q      | V       |         |         |
11+50       0.5454      0.78  |  Q      | V       |         |         |
11+55       0.5508      0.78  |  Q      | V       |         |         |
12+ 0       0.5562      0.79  |  Q      | V       |         |         |
12+ 5       0.5617      0.79  |  Q      | V       |         |         |
12+10       0.5670      0.78  |  Q      | V       |         |         |
12+15       0.5722      0.75  |  Q      |  V      |         |         |
12+20       0.5772      0.72  | Q       |  V      |         |         |
12+25       0.5819      0.68  | Q       |  V      |         |         |
12+30       0.5864      0.66  | Q       |  V      |         |         |
12+35       0.5909      0.65  | Q       |  V      |         |         |
12+40       0.5953      0.64  | Q       |  V      |         |         |
12+45       0.5997      0.64  | Q       |  V      |         |         |
12+50       0.6041      0.64  | Q       |  V      |         |         |
12+55       0.6085      0.64  | Q       |  V      |         |         |
13+ 0       0.6129      0.64  | Q       |   V     |         |         |
13+ 5       0.6173      0.65  | Q       |   V     |         |         |
13+10       0.6218      0.65  | Q       |   V     |         |         |
13+15       0.6263      0.66  | Q       |   V     |         |         |
13+20       0.6309      0.66  | Q       |   V     |         |         |
13+25       0.6355      0.67  | Q       |   V     |         |         |
13+30       0.6402      0.68  | Q       |   V     |         |         |
13+35       0.6449      0.69  | Q       |   V     |         |         |
13+40       0.6497      0.70  | Q       |   V     |         |         |
13+45       0.6545      0.71  | Q       |   V     |         |         |
13+50       0.6595      0.72  | Q       |    V    |         |         |
13+55       0.6645      0.73  | Q       |    V    |         |         |
14+ 0       0.6696      0.74  | Q       |    V    |         |         |
14+ 5       0.6748      0.76  |  Q      |    V    |         |         |
14+10       0.6801      0.77  |  Q      |    V    |         |         |
14+15       0.6856      0.79  |  Q      |    V    |         |         |
14+20       0.6911      0.80  |  Q      |    V    |         |         |
14+25       0.6968      0.82  |  Q      |    V    |         |         |
14+30       0.7026      0.84  |  Q      |     V   |         |         |
14+35       0.7085      0.86  |  Q      |     V   |         |         |
14+40       0.7146      0.89  |  Q      |     V   |         |         |
14+45       0.7209      0.91  |  Q      |     V   |         |         |
14+50       0.7274      0.94  |  Q      |     V   |         |         |
14+55       0.7341      0.97  |  Q      |     V   |         |         |
15+ 0       0.7410      1.00  |   Q     |     V   |         |         |
15+ 5       0.7481      1.04  |   Q     |      V  |         |         |
15+10       0.7555      1.08  |   Q     |      V  |         |         |
15+15       0.7632      1.12  |   Q     |      V  |         |         |
15+20       0.7713      1.17  |   Q     |      V  |         |         |
15+25       0.7798      1.23  |   Q     |      V  |         |         |
15+30       0.7887      1.30  |    Q    |       V |         |         |
15+35       0.7982      1.38  |    Q    |       V |         |         |
15+40       0.8083      1.47  |    Q    |       V |         |         |
15+45       0.8193      1.59  |     Q   |       V |         |         |
15+50       0.8312      1.73  |     Q   |        V|         |         |
15+55       0.8447      1.96  |      Q  |        V|         |         |
16+ 0       0.8612      2.39  |        Q|        V|         |         |
16+ 5       0.8862      3.64  |         |   Q     V         |         |
16+10       0.9252      5.66  |         |         |VQ       |         |
16+15       0.9780      7.66  |         |         | V       Q         |
16+20       1.0397      8.96  |         |         |  V      |    Q    |
16+25       1.0992      8.64  |         |         |    V    |   Q     |
16+30       1.1452      6.69  |         |         |     Q   |         |
16+35       1.1797      5.00  |         |        Q|      V  |         |
16+40       1.2066      3.92  |         |    Q    |      V  |         |
16+45       1.2292      3.27  |         |  Q      |       V |         |
```

```
16+50       1.2490      2.89  |         |Q        |       V |         |
16+55       1.2668      2.58  |         Q         |        V|         |
17+ 0       1.2829      2.34  |        Q|         |        V|         |
17+ 5       1.2976      2.13  |       Q |         |        V|         |
17+10       1.3109      1.93  |      Q  |         |         V         |
17+15       1.3231      1.78  |      Q  |         |         V         |
17+20       1.3347      1.68  |     Q   |         |         V         |
17+25       1.3452      1.52  |     Q   |         |         V         |
17+30       1.3551      1.44  |    Q    |         |         |V        |
17+35       1.3642      1.32  |    Q    |         |         |V        |
17+40       1.3728      1.25  |    Q    |         |         |V        |
17+45       1.3811      1.20  |   Q     |         |         |V        |
17+50       1.3890      1.15  |   Q     |         |         |V        |
17+55       1.3965      1.08  |   Q     |         |         |V        |
18+ 0       1.4034      1.01  |   Q     |         |         | V       |
18+ 5       1.4101      0.98  |  Q      |         |         | V       |
18+10       1.4166      0.94  |  Q      |         |         | V       |
18+15       1.4231      0.94  |  Q      |         |         | V       |
18+20       1.4295      0.93  |  Q      |         |         | V       |
18+25       1.4359      0.94  |  Q      |         |         | V       |
18+30       1.4423      0.92  |  Q      |         |         |  V      |
18+35       1.4486      0.91  |  Q      |         |         |  V      |
18+40       1.4549      0.91  |  Q      |         |         |  V      |
18+45       1.4610      0.90  |  Q      |         |         |  V      |
18+50       1.4672      0.89  |  Q      |         |         |  V      |
18+55       1.4731      0.87  |  Q      |         |         |  V      |
19+ 0       1.4789      0.83  |  Q      |         |         |  V      |
19+ 5       1.4841      0.76  |  Q      |         |         |  V      |
19+10       1.4893      0.75  | Q       |         |         |   V     |
19+15       1.4943      0.74  | Q       |         |         |   V     |
19+20       1.4994      0.73  | Q       |         |         |   V     |
19+25       1.5043      0.72  | Q       |         |         |   V     |
19+30       1.5092      0.71  | Q       |         |         |   V     |
19+35       1.5141      0.71  | Q       |         |         |   V     |
19+40       1.5189      0.70  | Q       |         |         |   V     |
19+45       1.5237      0.69  | Q       |         |         |   V     |
19+50       1.5284      0.68  | Q       |         |         |   V     |
19+55       1.5330      0.68  | Q       |         |         |    V    |
20+ 0       1.5377      0.67  | Q       |         |         |    V    |
20+ 5       1.5423      0.67  | Q       |         |         |    V    |
20+10       1.5468      0.66  | Q       |         |         |    V    |
20+15       1.5513      0.66  | Q       |         |         |    V    |
20+20       1.5558      0.65  | Q       |         |         |    V    |
20+25       1.5602      0.64  | Q       |         |         |    V    |
20+30       1.5646      0.64  | Q       |         |         |    V    |
20+35       1.5690      0.63  | Q       |         |         |    V    |
20+40       1.5733      0.63  | Q       |         |         |     V   |
20+45       1.5776      0.62  | Q       |         |         |     V   |
20+50       1.5819      0.62  | Q       |         |         |     V   |
20+55       1.5861      0.61  | Q       |         |         |     V   |
21+ 0       1.5903      0.61  | Q       |         |         |     V   |
21+ 5       1.5945      0.61  | Q       |         |         |     V   |
21+10       1.5986      0.60  | Q       |         |         |     V   |
21+15       1.6027      0.60  | Q       |         |         |     V   |
21+20       1.6068      0.59  | Q       |         |         |     V   |
21+25       1.6109      0.59  | Q       |         |         |     V   |
21+30       1.6149      0.58  | Q       |         |         |     V   |
21+35       1.6189      0.58  | Q       |         |         |      V  |
21+40       1.6228      0.58  | Q       |         |         |      V  |
21+45       1.6268      0.57  | Q       |         |         |      V  |
21+50       1.6307      0.57  | Q       |         |         |      V  |
21+55       1.6345      0.56  | Q       |         |         |      V  |
22+ 0       1.6384      0.56  | Q       |         |         |      V  |
22+ 5       1.6422      0.56  | Q       |         |         |      V  |
22+10       1.6460      0.55  | Q       |         |         |      V  |
22+15       1.6498      0.55  | Q       |         |         |      V  |
22+20       1.6536      0.55  | Q       |         |         |      V  |
22+25       1.6573      0.54  | Q       |         |         |      V  |
22+30       1.6610      0.54  | Q       |         |         |       V |
22+35       1.6647      0.54  | Q       |         |         |       V |
22+40       1.6684      0.53  | Q       |         |         |       V |
22+45       1.6721      0.53  | Q       |         |         |       V |
22+50       1.6757      0.53  | Q       |         |         |       V |
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   22+55       1.6793      0.52   | Q       |         |         |       V |
   23+ 0       1.6829      0.52   | Q       |         |         |       V |
   23+ 5       1.6865      0.52   | Q       |         |         |       V |
   23+10       1.6900      0.52   | Q       |         |         |       V |
   23+15       1.6936      0.51   | Q       |         |         |       V |
   23+20       1.6971      0.51   | Q       |         |         |       V |
   23+25       1.7006      0.51   | Q       |         |         |       V |
   23+30       1.7041      0.51   | Q       |         |         |        V|
   23+35       1.7075      0.50   | Q       |         |         |        V|
   23+40       1.7110      0.50   | Q       |         |         |        V|
   23+45       1.7144      0.50   |Q        |         |         |        V|
   23+50       1.7178      0.50   |Q        |         |         |        V|
   23+55       1.7212      0.49   |Q        |         |         |        V|
   24+ 0       1.7246      0.49   |Q        |         |         |        V|
   24+ 5       1.7279      0.48   |Q        |         |         |        V|
   24+10       1.7310      0.45   |Q        |         |         |        V|
   24+15       1.7337      0.39   |Q        |         |         |        V|
   24+20       1.7358      0.32   |Q        |         |         |        V|
   24+25       1.7375      0.24   Q         |         |         |        V|
   24+30       1.7388      0.19   Q         |         |         |        V|
   24+35       1.7399      0.15   Q         |         |         |        V|
   24+40       1.7408      0.13   Q         |         |         |        V|
   24+45       1.7416      0.11   Q         |         |         |        V|
   24+50       1.7422      0.10   Q         |         |         |        V|
   24+55       1.7428      0.09   Q         |         |         |        V|
   25+ 0       1.7434      0.08   Q         |         |         |        V|
   25+ 5       1.7438      0.07   Q         |         |         |        V|
   25+10       1.7442      0.06   Q         |         |         |        V|
   25+15       1.7446      0.05   Q         |         |         |        V|
   25+20       1.7449      0.05   Q         |         |         |        V|
   25+25       1.7452      0.04   Q         |         |         |        V|
   25+30       1.7455      0.04   Q         |         |         |        V|
   25+35       1.7457      0.03   Q         |         |         |        V|
   25+40       1.7459      0.03   Q         |         |         |        V|
   25+45       1.7461      0.03   Q         |         |         |        V|
   25+50       1.7462      0.02   Q         |         |         |        V|
   25+55       1.7464      0.02   Q         |         |         |        V|
   26+ 0       1.7465      0.02   Q         |         |         |        V|
   26+ 5       1.7466      0.01   Q         |         |         |        V|
   26+10       1.7467      0.01   Q         |         |         |        V|
   26+15       1.7467      0.01   Q         |         |         |        V|
   26+20       1.7468      0.01   Q         |         |         |        V|
   26+25       1.7469      0.01   Q         |         |         |        V|
   26+30       1.7469      0.01   Q         |         |         |        V|
   26+35       1.7469      0.01   Q         |         |         |        V|
   26+40       1.7470      0.00   Q         |         |         |        V|
   26+45       1.7470      0.00   Q         |         |         |        V|
   26+50       1.7470      0.00   Q         |         |         |        V|
   26+55       1.7470      0.00   Q         |         |         |         V
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ATTACHMENT 3

Developed Conditions
Rational Method Calculations

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                San Bernardino County Rational Hydrology Program

                    (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2019 Version 9.1
        Rational Hydrology Study        Date: 03/23/21
------------------------------------------------------------------------
204828 - TEC EQUIPMENT 776 MILL ST
DEVELOPED CONDITIONS
25-YEAR, 1-HOUR STORM
BY: JTS  DATE: 03-23-21
------------------------------------------------------------------------


Program License Serial Number 6320

------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------
Rational hydrology study storm event year is    25.0
   10 Year storm 1 hour rainfall  =      0.830(In.)
  100 Year storm 1 hour rainfall  =      1.280(In.)
Computed rainfall intensity:
Storm year =    25.00   1 hour rainfall =     1.009 (In.)
Slope used for rainfall intensity curve b =  0.6000
Soil antecedent moisture condition (AMC) = 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        0.000 to Point/Station        1.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1500     Max loss rate(Fm)=     0.147(In/Hr)
Initial subarea data:
Initial area flow distance =    233.000(Ft.)
Top (of initial area) elevation =  1023.100(Ft.)
Bottom (of initial area) elevation =  1019.630(Ft.)
Difference in elevation =     3.470(Ft.)
Slope =    0.01489  s(%)=       1.49
TC = k(0.311)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.394 min.
Rainfall intensity =      3.867(In/Hr) for a    25.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.866
Subarea runoff =      1.975(CFS)
Total initial stream area =        0.590(Ac.)
Pervious area fraction = 0.150
Initial area Fm value =    0.147(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1015.630(Ft.)
Downstream point/station elevation =  1014.650(Ft.)
Pipe length  =   326.50(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.975(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     1.975(CFS)
Normal flow depth in pipe =    7.27(In.)
Flow top width inside pipe =   17.66(In.)
Critical Depth =    6.36(In.)
Pipe flow velocity =      2.95(Ft/s)
Travel time through pipe =    1.84 min.
Time of concentration (TC) =     8.24 min.
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        2.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Time of concentration =     8.24 min.
Rainfall intensity =      3.322(In/Hr) for a    25.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.868
Subarea runoff =      2.525(CFS) for    0.970(Ac.)
Total runoff =      4.500(CFS)
Effective area this stream =        1.56(Ac.)
Total Study Area (Main Stream No. 1) =        1.56(Ac.)
Area averaged Fm value =    0.116(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1014.650(Ft.)
Downstream point/station elevation =  1013.960(Ft.)
Pipe length  =   230.70(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.500(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     4.500(CFS)
Normal flow depth in pipe =   12.00(In.)
Flow top width inside pipe =   16.97(In.)
Critical Depth =    9.77(In.)
Pipe flow velocity =      3.60(Ft/s)
Travel time through pipe =    1.07 min.
Time of concentration (TC) =     9.31 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        3.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1400     Max loss rate(Fm)=     0.137(In/Hr)
Time of concentration =     9.31 min.
Rainfall intensity =      3.087(In/Hr) for a    25.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.863
Subarea runoff =      4.318(CFS) for    1.750(Ac.)
Total runoff =      8.818(CFS)
Effective area this stream =        3.31(Ac.)
Total Study Area (Main Stream No. 1) =        3.31(Ac.)
Area averaged Fm value =    0.127(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1013.960(Ft.)
Downstream point/station elevation =  1013.500(Ft.)
Pipe length  =   137.30(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.818(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
     1.087(Ft.)  at the headworks or inlet of the pipe(s)
 Pipe friction loss =      0.967(Ft.)
 Minor friction loss =      0.580(Ft.)  K-factor =   1.50
Pipe flow velocity =      4.99(Ft/s)
Travel time through pipe =    0.46 min.
Time of concentration (TC) =     9.76 min.
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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      3.310(Ac.)
Runoff from this stream =      8.818(CFS)
Time of concentration =    9.76 min.
Rainfall intensity =     2.999(In/Hr)
Area averaged loss rate (Fm) =    0.1272(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1301


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station        6.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.0900     Max loss rate(Fm)=     0.088(In/Hr)
Initial subarea data:
Initial area flow distance =   468.200(Ft.)
Top (of initial area) elevation =  1025.330(Ft.)
Bottom (of initial area) elevation =  1020.090(Ft.)
Difference in elevation =     5.240(Ft.)
Slope =    0.01119  s(%)=       1.12
TC = k(0.297)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.525 min.
Rainfall intensity =      3.254(In/Hr) for a    25.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.876
Subarea runoff =      7.123(CFS)
Total initial stream area =        2.500(Ac.)
Pervious area fraction = 0.090
Initial area Fm value =    0.088(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        4.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1016.090(Ft.)
Downstream point/station elevation =  1013.500(Ft.)
Pipe length  =   254.20(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.123(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     7.123(CFS)
Normal flow depth in pipe =   10.80(In.)
Flow top width inside pipe =   17.63(In.)
Critical Depth =   12.40(In.)
Pipe flow velocity =      6.44(Ft/s)
Travel time through pipe =    0.66 min.
Time of concentration (TC) =     9.18 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        4.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.500(Ac.)
Runoff from this stream =      7.123(CFS)
Time of concentration =    9.18 min.
Rainfall intensity =     3.112(In/Hr)
Area averaged loss rate (Fm) =    0.0880(In/Hr)
Area averaged Pervious ratio (Ap) = 0.0900
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)
```

```
1      8.82     3.310      9.76    0.127      2.999
2      7.12     2.500      9.18    0.088      3.112
Qmax(1) =
           1.000 *    1.000 *     8.818) +
           0.963 *    1.000 *     7.123) + =      15.676
Qmax(2) =
           1.039 *    0.940 *     8.818) +
           1.000 *    1.000 *     7.123) + =      15.741

Total of 2 streams to confluence:
Flow rates before confluence point:
       8.818       7.123
Maximum flow rates at confluence using above data:
       15.676       15.741
Area of streams before confluence:
        3.310        2.500
Effective area values after confluence:
        5.810        5.613
Results of confluence:
Total flow rate =     15.741(CFS)
Time of concentration =     9.183 min.
Effective stream area after confluence =      5.613(Ac.)
Study area average Pervious fraction(Ap) =  0.113
Study area average soil loss rate(Fm) =    0.110(In/Hr)
Study area total (this main stream) =       5.81(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        8.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________
Upstream point elevation =  1019.630(Ft.)
Downstream point elevation =  1019.430(Ft.)
Channel length thru subarea  =   242.000(Ft.)
Channel base width      =   10.000(Ft.)
Slope or 'Z' of left channel bank =   0.000
Slope or 'Z' of right channel bank =   0.000
Estimated mean flow rate at midpoint of channel =     15.767(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =     15.767(CFS)
Depth of flow =   0.741(Ft.), Average velocity =   2.127(Ft/s)
Channel flow top width =   10.000(Ft.)
Flow Velocity =    2.13(Ft/s)
Travel time  =    1.90 min.
Time of concentration =   11.08 min.
Critical depth =      0.426(Ft.)
 Adding area flow to channel
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.8200     Max loss rate(Fm)=     0.802(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =     15.625(CFS)
therefore the upstream flow rate of Q =     15.741(CFS) is being used
Rainfall intensity =      2.780(In/Hr) for a    25.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.825
Subarea runoff =      0.000(CFS) for    1.200(Ac.)
Total runoff =     15.741(CFS)
Effective area this stream =        6.81(Ac.)
Total Study Area (Main Stream No. 1) =        7.01(Ac.)
Area averaged Fm value =    0.232(In/Hr)
Depth of flow =   0.740(Ft.), Average velocity =   2.126(Ft/s)
Critical depth =      0.426(Ft.)
End of computations, Total Study Area =            7.01 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.234
```

```
Area averaged SCS curve number =  32.0
```

```
                San Bernardino County Rational Hydrology Program

                    (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2019 Version 9.1
        Rational Hydrology Study        Date: 03/23/21
------------------------------------------------------------------------
204828 - TEC EQUIPMENT 776 MILL ST
DEVELOPED CONDITIONS
100-YEAR, 1-HOUR STORM
BY: JTS  DATE: 03-23-21
------------------------------------------------------------------------


Program License Serial Number 6320

------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
   10 Year storm 1 hour rainfall  =      0.830(In.)
  100 Year storm 1 hour rainfall  =      1.280(In.)
Computed rainfall intensity:
Storm year =   100.00   1 hour rainfall =     1.280 (In.)
Slope used for rainfall intensity curve b =  0.6000
Soil antecedent moisture condition (AMC) = 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        0.000 to Point/Station        1.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.1500     Max loss rate(Fm)=     0.118(In/Hr)
Initial subarea data:
Initial area flow distance =    233.000(Ft.)
Top (of initial area) elevation =  1023.100(Ft.)
Bottom (of initial area) elevation =  1019.630(Ft.)
Difference in elevation =     3.470(Ft.)
Slope =    0.01489  s(%)=       1.49
TC = k(0.311)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.394 min.
Rainfall intensity =      4.905(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.878
Subarea runoff =      2.542(CFS)
Total initial stream area =        0.590(Ac.)
Pervious area fraction = 0.150
Initial area Fm value =    0.118(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1015.630(Ft.)
Downstream point/station elevation =  1014.650(Ft.)
Pipe length  =   326.50(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.542(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     2.542(CFS)
Normal flow depth in pipe =    8.38(In.)
Flow top width inside pipe =   17.96(In.)
Critical Depth =    7.24(In.)
Pipe flow velocity =      3.16(Ft/s)
Travel time through pipe =    1.72 min.
Time of concentration (TC) =     8.12 min.
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       2.000 to Point/Station       2.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.079(In/Hr)
Time of concentration =     8.12 min.
Rainfall intensity =      4.250(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.880
Subarea runoff =      3.294(CFS) for    0.970(Ac.)
Total runoff =      5.836(CFS)
Effective area this stream =        1.56(Ac.)
Total Study Area (Main Stream No. 1) =        1.56(Ac.)
Area averaged Fm value =    0.093(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       2.000 to Point/Station       3.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1014.650(Ft.)
Downstream point/station elevation =  1013.960(Ft.)
Pipe length  =   230.70(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.836(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
     0.276(Ft.)  at the headworks or inlet of the pipe(s)
 Pipe friction loss =      0.712(Ft.)
 Minor friction loss =      0.254(Ft.)  K-factor =   1.50
Pipe flow velocity =      3.30(Ft/s)
Travel time through pipe =    1.16 min.
Time of concentration (TC) =     9.28 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       3.000 to Point/Station       3.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.1400     Max loss rate(Fm)=     0.110(In/Hr)
Time of concentration =     9.28 min.
Rainfall intensity =      3.922(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.877
Subarea runoff =      5.543(CFS) for    1.750(Ac.)
Total runoff =     11.379(CFS)
Effective area this stream =        3.31(Ac.)
Total Study Area (Main Stream No. 1) =        3.31(Ac.)
Area averaged Fm value =    0.102(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       3.000 to Point/Station       4.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1013.960(Ft.)
Downstream point/station elevation =  1013.500(Ft.)
Pipe length  =   137.30(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.379(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
     2.117(Ft.)  at the headworks or inlet of the pipe(s)
 Pipe friction loss =      1.611(Ft.)
```

```
 Minor friction loss =      0.966(Ft.)  K-factor =   1.50
Pipe flow velocity =      6.44(Ft/s)
Travel time through pipe =    0.36 min.
Time of concentration (TC) =     9.64 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      3.310(Ac.)
Runoff from this stream =     11.379(CFS)
Time of concentration =    9.64 min.
Rainfall intensity =     3.835(In/Hr)
Area averaged loss rate (Fm) =    0.1021(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1301


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station        6.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.0900     Max loss rate(Fm)=     0.071(In/Hr)
Initial subarea data:
Initial area flow distance =   468.200(Ft.)
Top (of initial area) elevation =  1025.330(Ft.)
Bottom (of initial area) elevation =  1020.090(Ft.)
Difference in elevation =     5.240(Ft.)
Slope =    0.01119  s(%)=       1.12
TC = k(0.297)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.525 min.
Rainfall intensity =      4.127(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.885
Subarea runoff =      9.128(CFS)
Total initial stream area =        2.500(Ac.)
Pervious area fraction = 0.090
Initial area Fm value =    0.071(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        4.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1016.090(Ft.)
Downstream point/station elevation =  1013.500(Ft.)
Pipe length  =   254.20(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.128(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     9.128(CFS)
Normal flow depth in pipe =   12.87(In.)
Flow top width inside pipe =   16.25(In.)
Critical Depth =   14.02(In.)
Pipe flow velocity =      6.75(Ft/s)
Travel time through pipe =    0.63 min.
Time of concentration (TC) =     9.15 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        4.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.500(Ac.)
Runoff from this stream =      9.128(CFS)
Time of concentration =    9.15 min.
Rainfall intensity =     3.955(In/Hr)
Area averaged loss rate (Fm) =    0.0707(In/Hr)
Area averaged Pervious ratio (Ap) = 0.0900
```

```
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     11.38     3.310      9.64    0.102      3.835
2      9.13     2.500      9.15    0.071      3.955
Qmax(1) =
           1.000 *    1.000 *    11.379) +
           0.969 *    1.000 *     9.128) + =      20.224
Qmax(2) =
           1.032 *    0.950 *    11.379) +
           1.000 *    1.000 *     9.128) + =      20.284

Total of 2 streams to confluence:
Flow rates before confluence point:
      11.379       9.128
Maximum flow rates at confluence using above data:
       20.224       20.284
Area of streams before confluence:
        3.310        2.500
Effective area values after confluence:
        5.810        5.643
Results of confluence:
Total flow rate =     20.284(CFS)
Time of concentration =     9.153 min.
Effective stream area after confluence =      5.643(Ac.)
Study area average Pervious fraction(Ap) =  0.113
Study area average soil loss rate(Fm) =    0.089(In/Hr)
Study area total (this main stream) =       5.81(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station       8.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________
Upstream point elevation =  1019.630(Ft.)
Downstream point elevation =  1019.430(Ft.)
Channel length thru subarea  =   242.000(Ft.)
Channel base width      =   10.000(Ft.)
Slope or 'Z' of left channel bank =   0.000
Slope or 'Z' of right channel bank =   0.000
Estimated mean flow rate at midpoint of channel =     20.586(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel   =    1.500(Ft.)
Flow(q) thru subarea =     20.586(CFS)
Depth of flow =   0.878(Ft.), Average velocity =   2.344(Ft/s)
Channel flow top width =   10.000(Ft.)
Flow Velocity =    2.34(Ft/s)
Travel time  =    1.72 min.
Time of concentration =   10.87 min.
Critical depth =      0.508(Ft.)
 Adding area flow to channel
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.8200     Max loss rate(Fm)=     0.644(In/Hr)
Rainfall intensity =      3.567(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.853
Subarea runoff =      0.540(CFS) for    1.200(Ac.)
Total runoff =     20.823(CFS)
Effective area this stream =        6.84(Ac.)
Total Study Area (Main Stream No. 1) =        7.01(Ac.)
Area averaged Fm value =    0.186(In/Hr)
Depth of flow =   0.885(Ft.), Average velocity =   2.354(Ft/s)
Critical depth =      0.516(Ft.)
End of computations, Total Study Area =            7.01 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
```

```
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.234
Area averaged SCS curve number =  32.0
```

ATTACHMENT 4

Developed Conditions
Unit Hydrograph Calculations

```
        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 - 2018, Version 9.0

                Study date  03/23/21


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San Bernardino County Synthetic Unit Hydrology Method
                Manual date - August 1986


Program License Serial Number 6320

---------------------------------------------------------------------
204828 - TEC EQUIPMENT 776 MILL ST
DEVELOPED CONDITIONS
2-YEAR, 24-HOUR STORM
BY: JTS  DATE: 03-23-21
--------------------------------------------------------------------

        Storm Event Year = 2

        Antecedent Moisture Condition = 1

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format




Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 10
             7.01           1           0.83
--------------------------------------------------------------------
Rainfall data for year 2
             7.01           6           1.41
--------------------------------------------------------------------
Rainfall data for year 2
             7.01          24           2.40
--------------------------------------------------------------------
Rainfall data for year 100
             7.01           1           1.28
--------------------------------------------------------------------
Rainfall data for year 100
             7.01           6           2.60
--------------------------------------------------------------------
Rainfall data for year 100
             7.01          24           5.90
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 1)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 32.0      16.6          7.01      1.000     1.000    0.230    0.230

Area-averaged adjusted loss rate Fm (In/Hr) =  0.230

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC1)           Yield Fr
```

```
     1.61   0.230         32.0      16.6      12.00     0.000
     5.40   0.770         98.0      98.0       0.20     0.905

Area-averaged catchment yield fraction, Y =  0.697
Area-averaged low loss fraction, Yb =  0.303
User entry of time of concentration  =   0.180 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       7.01(Ac.)
Catchment Lag time =   0.144 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 57.8704
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.230(In/Hr)
Average low loss rate fraction (Yb) = 0.303 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.191(In)
Computed peak 30-minute rainfall =  0.391(In)
Specified peak 1-hour rainfall =  0.515(In)
Computed peak 3-hour rainfall =  0.955(In)
Specified peak 6-hour rainfall =  1.410(In)
Specified peak 24-hour rainfall =  2.400(In)


Rainfall depth area reduction factors:
Using a total area of       7.01(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.191(In)
30-minute factor = 1.000    Adjusted rainfall =  0.391(In)
1-hour factor = 1.000       Adjusted rainfall =  0.515(In)
3-hour factor = 1.000       Adjusted rainfall =  0.955(In)
6-hour factor = 1.000       Adjusted rainfall =  1.410(In)
24-hour factor = 1.000      Adjusted rainfall =  2.400(In)
---------------------------------------------------------------------

                        U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values            ((CFS))
---------------------------------------------------------------------
                (K =        84.78 (CFS))

  1                6.077                  5.152
  2               39.009                 27.919
  3               79.564                 34.381
  4               94.634                 12.776
  5               98.466                  3.248
  6               99.524                  0.897
  7              100.000                  0.404
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number              (In)                (In)
  1              0.1907               0.1907
  2              0.2516               0.0609
  3              0.2960               0.0443
  4              0.3321               0.0361
  5              0.3631               0.0310
  6              0.3905               0.0275
  7              0.4154               0.0248
  8              0.4381               0.0228
  9              0.4593               0.0211
 10              0.4791               0.0198
 11              0.4977               0.0186
 12              0.5153               0.0176
 13              0.5390               0.0237
 14              0.5619               0.0229
 15              0.5841               0.0222
 16              0.6057               0.0216
 17              0.6267               0.0210
 18              0.6471               0.0205
 19              0.6671               0.0200
 20              0.6866               0.0195
 21              0.7057               0.0191
 22              0.7244               0.0187
```

23	0.7427	0.0183
24	0.7607	0.0180
25	0.7783	0.0176
26	0.7957	0.0173
27	0.8127	0.0171
28	0.8295	0.0168
29	0.8460	0.0165
30	0.8623	0.0163
31	0.8783	0.0160
32	0.8941	0.0158
33	0.9097	0.0156
34	0.9251	0.0154
35	0.9403	0.0152
36	0.9553	0.0150
37	0.9701	0.0148
38	0.9848	0.0146
39	0.9992	0.0145
40	1.0135	0.0143
41	1.0277	0.0142
42	1.0417	0.0140
43	1.0555	0.0139
44	1.0693	0.0137
45	1.0828	0.0136
46	1.0963	0.0134
47	1.1096	0.0133
48	1.1228	0.0132
49	1.1359	0.0131
50	1.1489	0.0130
51	1.1617	0.0128
52	1.1744	0.0127
53	1.1871	0.0126
54	1.1996	0.0125
55	1.2120	0.0124
56	1.2244	0.0123
57	1.2366	0.0122
58	1.2487	0.0121
59	1.2608	0.0120
60	1.2727	0.0120
61	1.2846	0.0119
62	1.2964	0.0118
63	1.3081	0.0117
64	1.3197	0.0116
65	1.3313	0.0115
66	1.3427	0.0115
67	1.3541	0.0114
68	1.3654	0.0113
69	1.3767	0.0112
70	1.3878	0.0112
71	1.3989	0.0111
72	1.4100	0.0110
73	1.4175	0.0075
74	1.4249	0.0074
75	1.4322	0.0074
76	1.4395	0.0073
77	1.4468	0.0072
78	1.4539	0.0072
79	1.4611	0.0071
80	1.4681	0.0071
81	1.4751	0.0070
82	1.4821	0.0070
83	1.4890	0.0069
84	1.4959	0.0069
85	1.5027	0.0068
86	1.5094	0.0068
87	1.5162	0.0067
88	1.5228	0.0067
89	1.5294	0.0066
90	1.5360	0.0066
91	1.5425	0.0065
92	1.5490	0.0065
93	1.5554	0.0064
94	1.5618	0.0064
95	1.5682	0.0064

96	1.5745	0.0063
97	1.5808	0.0063
98	1.5870	0.0062
99	1.5932	0.0062
100	1.5994	0.0062
101	1.6055	0.0061
102	1.6116	0.0061
103	1.6176	0.0060
104	1.6236	0.0060
105	1.6296	0.0060
106	1.6355	0.0059
107	1.6414	0.0059
108	1.6473	0.0059
109	1.6531	0.0058
110	1.6589	0.0058
111	1.6647	0.0058
112	1.6704	0.0057
113	1.6762	0.0057
114	1.6818	0.0057
115	1.6875	0.0056
116	1.6931	0.0056
117	1.6987	0.0056
118	1.7042	0.0056
119	1.7098	0.0055
120	1.7153	0.0055
121	1.7207	0.0055
122	1.7262	0.0054
123	1.7316	0.0054
124	1.7370	0.0054
125	1.7423	0.0054
126	1.7477	0.0053
127	1.7530	0.0053
128	1.7583	0.0053
129	1.7635	0.0053
130	1.7687	0.0052
131	1.7740	0.0052
132	1.7791	0.0052
133	1.7843	0.0052
134	1.7894	0.0051
135	1.7945	0.0051
136	1.7996	0.0051
137	1.8047	0.0051
138	1.8097	0.0050
139	1.8148	0.0050
140	1.8198	0.0050
141	1.8247	0.0050
142	1.8297	0.0050
143	1.8346	0.0049
144	1.8395	0.0049
145	1.8444	0.0049
146	1.8493	0.0049
147	1.8541	0.0048
148	1.8590	0.0048
149	1.8638	0.0048
150	1.8686	0.0048
151	1.8733	0.0048
152	1.8781	0.0048
153	1.8828	0.0047
154	1.8875	0.0047
155	1.8922	0.0047
156	1.8969	0.0047
157	1.9016	0.0047
158	1.9062	0.0046
159	1.9108	0.0046
160	1.9154	0.0046
161	1.9200	0.0046
162	1.9246	0.0046
163	1.9291	0.0045
164	1.9337	0.0045
165	1.9382	0.0045
166	1.9427	0.0045
167	1.9472	0.0045
168	1.9516	0.0045

169	1.9561	0.0044
170	1.9605	0.0044
171	1.9649	0.0044
172	1.9693	0.0044
173	1.9737	0.0044
174	1.9781	0.0044
175	1.9824	0.0044
176	1.9868	0.0043
177	1.9911	0.0043
178	1.9954	0.0043
179	1.9997	0.0043
180	2.0040	0.0043
181	2.0082	0.0043
182	2.0125	0.0042
183	2.0167	0.0042
184	2.0209	0.0042
185	2.0251	0.0042
186	2.0293	0.0042
187	2.0335	0.0042
188	2.0377	0.0042
189	2.0418	0.0042
190	2.0460	0.0041
191	2.0501	0.0041
192	2.0542	0.0041
193	2.0583	0.0041
194	2.0624	0.0041
195	2.0665	0.0041
196	2.0705	0.0041
197	2.0746	0.0040
198	2.0786	0.0040
199	2.0826	0.0040
200	2.0866	0.0040
201	2.0906	0.0040
202	2.0946	0.0040
203	2.0986	0.0040
204	2.1026	0.0040
205	2.1065	0.0039
206	2.1104	0.0039
207	2.1144	0.0039
208	2.1183	0.0039
209	2.1222	0.0039
210	2.1261	0.0039
211	2.1299	0.0039
212	2.1338	0.0039
213	2.1377	0.0039
214	2.1415	0.0038
215	2.1453	0.0038
216	2.1492	0.0038
217	2.1530	0.0038
218	2.1568	0.0038
219	2.1606	0.0038
220	2.1644	0.0038
221	2.1681	0.0038
222	2.1719	0.0038
223	2.1756	0.0037
224	2.1794	0.0037
225	2.1831	0.0037
226	2.1868	0.0037
227	2.1905	0.0037
228	2.1942	0.0037
229	2.1979	0.0037
230	2.2016	0.0037
231	2.2053	0.0037
232	2.2089	0.0037
233	2.2126	0.0036
234	2.2162	0.0036
235	2.2198	0.0036
236	2.2234	0.0036
237	2.2271	0.0036
238	2.2307	0.0036
239	2.2342	0.0036
240	2.2378	0.0036
241	2.2414	0.0036

```
242              2.2450             0.0036
243              2.2485             0.0036
244              2.2521             0.0035
245              2.2556             0.0035
246              2.2591             0.0035
247              2.2627             0.0035
248              2.2662             0.0035
249              2.2697             0.0035
250              2.2732             0.0035
251              2.2766             0.0035
252              2.2801             0.0035
253              2.2836             0.0035
254              2.2870             0.0035
255              2.2905             0.0035
256              2.2939             0.0034
257              2.2974             0.0034
258              2.3008             0.0034
259              2.3042             0.0034
260              2.3076             0.0034
261              2.3110             0.0034
262              2.3144             0.0034
263              2.3178             0.0034
264              2.3212             0.0034
265              2.3245             0.0034
266              2.3279             0.0034
267              2.3313             0.0034
268              2.3346             0.0033
269              2.3379             0.0033
270              2.3413             0.0033
271              2.3446             0.0033
272              2.3479             0.0033
273              2.3512             0.0033
274              2.3545             0.0033
275              2.3578             0.0033
276              2.3611             0.0033
277              2.3644             0.0033
278              2.3677             0.0033
279              2.3709             0.0033
280              2.3742             0.0033
281              2.3774             0.0032
282              2.3807             0.0032
283              2.3839             0.0032
284              2.3871             0.0032
285              2.3904             0.0032
286              2.3936             0.0032
287              2.3968             0.0032
288              2.4000             0.0032
----------------------------------------------------------------------
Unit              Unit            Unit              Effective
Period            Rainfall        Soil-Loss         Rainfall
(number)           (In)           (In)                 (In)
----------------------------------------------------------------------
  1              0.0032          0.0010              0.0022
  2              0.0032          0.0010              0.0022
  3              0.0032          0.0010              0.0022
  4              0.0032          0.0010              0.0022
  5              0.0032          0.0010              0.0023
  6              0.0032          0.0010              0.0023
  7              0.0033          0.0010              0.0023
  8              0.0033          0.0010              0.0023
  9              0.0033          0.0010              0.0023
 10              0.0033          0.0010              0.0023
 11              0.0033          0.0010              0.0023
 12              0.0033          0.0010              0.0023
 13              0.0033          0.0010              0.0023
 14              0.0033          0.0010              0.0023
 15              0.0034          0.0010              0.0023
 16              0.0034          0.0010              0.0023
 17              0.0034          0.0010              0.0024
 18              0.0034          0.0010              0.0024
 19              0.0034          0.0010              0.0024
 20              0.0034          0.0010              0.0024
 21              0.0034          0.0010              0.0024
```

22	0.0034	0.0010	0.0024
23	0.0035	0.0010	0.0024
24	0.0035	0.0010	0.0024
25	0.0035	0.0011	0.0024
26	0.0035	0.0011	0.0024
27	0.0035	0.0011	0.0024
28	0.0035	0.0011	0.0024
29	0.0035	0.0011	0.0025
30	0.0035	0.0011	0.0025
31	0.0036	0.0011	0.0025
32	0.0036	0.0011	0.0025
33	0.0036	0.0011	0.0025
34	0.0036	0.0011	0.0025
35	0.0036	0.0011	0.0025
36	0.0036	0.0011	0.0025
37	0.0036	0.0011	0.0025
38	0.0036	0.0011	0.0025
39	0.0037	0.0011	0.0026
40	0.0037	0.0011	0.0026
41	0.0037	0.0011	0.0026
42	0.0037	0.0011	0.0026
43	0.0037	0.0011	0.0026
44	0.0037	0.0011	0.0026
45	0.0038	0.0011	0.0026
46	0.0038	0.0011	0.0026
47	0.0038	0.0011	0.0026
48	0.0038	0.0012	0.0026
49	0.0038	0.0012	0.0027
50	0.0038	0.0012	0.0027
51	0.0039	0.0012	0.0027
52	0.0039	0.0012	0.0027
53	0.0039	0.0012	0.0027
54	0.0039	0.0012	0.0027
55	0.0039	0.0012	0.0027
56	0.0039	0.0012	0.0027
57	0.0040	0.0012	0.0028
58	0.0040	0.0012	0.0028
59	0.0040	0.0012	0.0028
60	0.0040	0.0012	0.0028
61	0.0040	0.0012	0.0028
62	0.0040	0.0012	0.0028
63	0.0041	0.0012	0.0028
64	0.0041	0.0012	0.0028
65	0.0041	0.0012	0.0029
66	0.0041	0.0013	0.0029
67	0.0042	0.0013	0.0029
68	0.0042	0.0013	0.0029
69	0.0042	0.0013	0.0029
70	0.0042	0.0013	0.0029
71	0.0042	0.0013	0.0030
72	0.0042	0.0013	0.0030
73	0.0043	0.0013	0.0030
74	0.0043	0.0013	0.0030
75	0.0043	0.0013	0.0030
76	0.0043	0.0013	0.0030
77	0.0044	0.0013	0.0030
78	0.0044	0.0013	0.0031
79	0.0044	0.0013	0.0031
80	0.0044	0.0013	0.0031
81	0.0045	0.0014	0.0031
82	0.0045	0.0014	0.0031
83	0.0045	0.0014	0.0031
84	0.0045	0.0014	0.0032
85	0.0046	0.0014	0.0032
86	0.0046	0.0014	0.0032
87	0.0046	0.0014	0.0032
88	0.0046	0.0014	0.0032
89	0.0047	0.0014	0.0033
90	0.0047	0.0014	0.0033
91	0.0047	0.0014	0.0033
92	0.0048	0.0014	0.0033
93	0.0048	0.0015	0.0033
94	0.0048	0.0015	0.0034

95	0.0048	0.0015	0.0034
96	0.0049	0.0015	0.0034
97	0.0049	0.0015	0.0034
98	0.0049	0.0015	0.0034
99	0.0050	0.0015	0.0035
100	0.0050	0.0015	0.0035
101	0.0050	0.0015	0.0035
102	0.0051	0.0015	0.0035
103	0.0051	0.0016	0.0036
104	0.0051	0.0016	0.0036
105	0.0052	0.0016	0.0036
106	0.0052	0.0016	0.0036
107	0.0053	0.0016	0.0037
108	0.0053	0.0016	0.0037
109	0.0053	0.0016	0.0037
110	0.0054	0.0016	0.0037
111	0.0054	0.0016	0.0038
112	0.0054	0.0017	0.0038
113	0.0055	0.0017	0.0038
114	0.0055	0.0017	0.0039
115	0.0056	0.0017	0.0039
116	0.0056	0.0017	0.0039
117	0.0057	0.0017	0.0040
118	0.0057	0.0017	0.0040
119	0.0058	0.0018	0.0040
120	0.0058	0.0018	0.0040
121	0.0059	0.0018	0.0041
122	0.0059	0.0018	0.0041
123	0.0060	0.0018	0.0042
124	0.0060	0.0018	0.0042
125	0.0061	0.0018	0.0042
126	0.0061	0.0019	0.0043
127	0.0062	0.0019	0.0043
128	0.0062	0.0019	0.0043
129	0.0063	0.0019	0.0044
130	0.0064	0.0019	0.0044
131	0.0064	0.0020	0.0045
132	0.0065	0.0020	0.0045
133	0.0066	0.0020	0.0046
134	0.0066	0.0020	0.0046
135	0.0067	0.0020	0.0047
136	0.0068	0.0021	0.0047
137	0.0069	0.0021	0.0048
138	0.0069	0.0021	0.0048
139	0.0070	0.0021	0.0049
140	0.0071	0.0021	0.0049
141	0.0072	0.0022	0.0050
142	0.0072	0.0022	0.0050
143	0.0074	0.0022	0.0051
144	0.0074	0.0023	0.0052
145	0.0110	0.0033	0.0077
146	0.0111	0.0034	0.0077
147	0.0112	0.0034	0.0078
148	0.0113	0.0034	0.0079
149	0.0115	0.0035	0.0080
150	0.0115	0.0035	0.0080
151	0.0117	0.0036	0.0082
152	0.0118	0.0036	0.0082
153	0.0120	0.0036	0.0083
154	0.0120	0.0037	0.0084
155	0.0122	0.0037	0.0085
156	0.0123	0.0037	0.0086
157	0.0125	0.0038	0.0087
158	0.0126	0.0038	0.0088
159	0.0128	0.0039	0.0090
160	0.0130	0.0039	0.0090
161	0.0132	0.0040	0.0092
162	0.0133	0.0040	0.0093
163	0.0136	0.0041	0.0095
164	0.0137	0.0042	0.0096
165	0.0140	0.0042	0.0098
166	0.0142	0.0043	0.0099
167	0.0145	0.0044	0.0101

168	0.0146	0.0044	0.0102
169	0.0150	0.0046	0.0105
170	0.0152	0.0046	0.0106
171	0.0156	0.0047	0.0109
172	0.0158	0.0048	0.0110
173	0.0163	0.0049	0.0113
174	0.0165	0.0050	0.0115
175	0.0171	0.0052	0.0119
176	0.0173	0.0053	0.0121
177	0.0180	0.0055	0.0125
178	0.0183	0.0056	0.0128
179	0.0191	0.0058	0.0133
180	0.0195	0.0059	0.0136
181	0.0205	0.0062	0.0142
182	0.0210	0.0064	0.0146
183	0.0222	0.0067	0.0155
184	0.0229	0.0070	0.0160
185	0.0176	0.0053	0.0123
186	0.0186	0.0056	0.0130
187	0.0211	0.0064	0.0147
188	0.0228	0.0069	0.0159
189	0.0275	0.0083	0.0191
190	0.0310	0.0094	0.0216
191	0.0443	0.0134	0.0309
192	0.0609	0.0185	0.0424
193	0.1907	0.0192	0.1715
194	0.0361	0.0109	0.0251
195	0.0248	0.0075	0.0173
196	0.0198	0.0060	0.0138
197	0.0237	0.0072	0.0165
198	0.0216	0.0065	0.0150
199	0.0200	0.0061	0.0139
200	0.0187	0.0057	0.0130
201	0.0176	0.0054	0.0123
202	0.0168	0.0051	0.0117
203	0.0160	0.0049	0.0112
204	0.0154	0.0047	0.0107
205	0.0148	0.0045	0.0103
206	0.0143	0.0043	0.0100
207	0.0139	0.0042	0.0097
208	0.0134	0.0041	0.0094
209	0.0131	0.0040	0.0091
210	0.0127	0.0039	0.0089
211	0.0124	0.0038	0.0087
212	0.0121	0.0037	0.0085
213	0.0119	0.0036	0.0083
214	0.0116	0.0035	0.0081
215	0.0114	0.0035	0.0079
216	0.0112	0.0034	0.0078
217	0.0075	0.0023	0.0052
218	0.0073	0.0022	0.0051
219	0.0071	0.0022	0.0050
220	0.0070	0.0021	0.0048
221	0.0068	0.0021	0.0047
222	0.0067	0.0020	0.0046
223	0.0065	0.0020	0.0045
224	0.0064	0.0019	0.0045
225	0.0063	0.0019	0.0044
226	0.0062	0.0019	0.0043
227	0.0060	0.0018	0.0042
228	0.0059	0.0018	0.0041
229	0.0058	0.0018	0.0041
230	0.0057	0.0017	0.0040
231	0.0056	0.0017	0.0039
232	0.0056	0.0017	0.0039
233	0.0055	0.0017	0.0038
234	0.0054	0.0016	0.0038
235	0.0053	0.0016	0.0037
236	0.0052	0.0016	0.0036
237	0.0052	0.0016	0.0036
238	0.0051	0.0015	0.0035
239	0.0050	0.0015	0.0035
240	0.0050	0.0015	0.0035

```
      241              0.0049           0.0015              0.0034
      242              0.0048           0.0015              0.0034
      243              0.0048           0.0014              0.0033
      244              0.0047           0.0014              0.0033
      245              0.0047           0.0014              0.0032
      246              0.0046           0.0014              0.0032
      247              0.0045           0.0014              0.0032
      248              0.0045           0.0014              0.0031
      249              0.0044           0.0013              0.0031
      250              0.0044           0.0013              0.0031
      251              0.0044           0.0013              0.0030
      252              0.0043           0.0013              0.0030
      253              0.0043           0.0013              0.0030
      254              0.0042           0.0013              0.0029
      255              0.0042           0.0013              0.0029
      256              0.0041           0.0013              0.0029
      257              0.0041           0.0012              0.0029
      258              0.0041           0.0012              0.0028
      259              0.0040           0.0012              0.0028
      260              0.0040           0.0012              0.0028
      261              0.0039           0.0012              0.0028
      262              0.0039           0.0012              0.0027
      263              0.0039           0.0012              0.0027
      264              0.0038           0.0012              0.0027
      265              0.0038           0.0012              0.0027
      266              0.0038           0.0011              0.0026
      267              0.0037           0.0011              0.0026
      268              0.0037           0.0011              0.0026
      269              0.0037           0.0011              0.0026
      270              0.0037           0.0011              0.0025
      271              0.0036           0.0011              0.0025
      272              0.0036           0.0011              0.0025
      273              0.0036           0.0011              0.0025
      274              0.0035           0.0011              0.0025
      275              0.0035           0.0011              0.0025
      276              0.0035           0.0011              0.0024
      277              0.0035           0.0011              0.0024
      278              0.0034           0.0010              0.0024
      279              0.0034           0.0010              0.0024
      280              0.0034           0.0010              0.0024
      281              0.0034           0.0010              0.0023
      282              0.0033           0.0010              0.0023
      283              0.0033           0.0010              0.0023
      284              0.0033           0.0010              0.0023
      285              0.0033           0.0010              0.0023
      286              0.0033           0.0010              0.0023
      287              0.0032           0.0010              0.0023
      288              0.0032           0.0010              0.0022
      --------------------------------------------------------------------
      --------------------------------------------------------------------
      Total soil rain loss =      0.69(In)
      Total effective rainfall =      1.71(In)
      Peak flow rate in flood hydrograph =      7.36(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
-----------------------------------------------------------------------
  0+ 5       0.0001      0.01  Q         |         |         |         |
  0+10       0.0006      0.07  Q         |         |         |         |
  0+15       0.0016      0.15  Q         |         |         |         |
  0+20       0.0029      0.18  Q         |         |         |         |
  0+25       0.0042      0.19  Q         |         |         |         |
  0+30       0.0055      0.19  Q         |         |         |         |
  0+35       0.0068      0.19  Q         |         |         |         |
  0+40       0.0081      0.19  Q         |         |         |         |
  0+45       0.0094      0.19  Q         |         |         |         |
  0+50       0.0108      0.19  Q         |         |         |         |
```

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0+55       0.0121      0.19  Q         |         |         |         |
1+ 0       0.0134      0.19  Q         |         |         |         |
1+ 5       0.0148      0.20  Q         |         |         |         |
1+10       0.0161      0.20  Q         |         |         |         |
1+15       0.0175      0.20  Q         |         |         |         |
1+20       0.0188      0.20  Q         |         |         |         |
1+25       0.0202      0.20  Q         |         |         |         |
1+30       0.0216      0.20  Q         |         |         |         |
1+35       0.0230      0.20  Q         |         |         |         |
1+40       0.0243      0.20  Q         |         |         |         |
1+45       0.0257      0.20  QV        |         |         |         |
1+50       0.0271      0.20  QV        |         |         |         |
1+55       0.0285      0.20  QV        |         |         |         |
2+ 0       0.0299      0.20  QV        |         |         |         |
2+ 5       0.0313      0.20  QV        |         |         |         |
2+10       0.0327      0.20  QV        |         |         |         |
2+15       0.0341      0.21  QV        |         |         |         |
2+20       0.0355      0.21  QV        |         |         |         |
2+25       0.0370      0.21  QV        |         |         |         |
2+30       0.0384      0.21  QV        |         |         |         |
2+35       0.0398      0.21  QV        |         |         |         |
2+40       0.0413      0.21  QV        |         |         |         |
2+45       0.0427      0.21  QV        |         |         |         |
2+50       0.0442      0.21  QV        |         |         |         |
2+55       0.0456      0.21  QV        |         |         |         |
3+ 0       0.0471      0.21  QV        |         |         |         |
3+ 5       0.0486      0.21  QV        |         |         |         |
3+10       0.0500      0.21  Q V       |         |         |         |
3+15       0.0515      0.21  Q V       |         |         |         |
3+20       0.0530      0.22  Q V       |         |         |         |
3+25       0.0545      0.22  Q V       |         |         |         |
3+30       0.0560      0.22  Q V       |         |         |         |
3+35       0.0575      0.22  Q V       |         |         |         |
3+40       0.0590      0.22  Q V       |         |         |         |
3+45       0.0605      0.22  Q V       |         |         |         |
3+50       0.0620      0.22  Q V       |         |         |         |
3+55       0.0636      0.22  Q V       |         |         |         |
4+ 0       0.0651      0.22  Q V       |         |         |         |
4+ 5       0.0666      0.22  Q V       |         |         |         |
4+10       0.0682      0.22  Q V       |         |         |         |
4+15       0.0698      0.23  Q V       |         |         |         |
4+20       0.0713      0.23  Q V       |         |         |         |
4+25       0.0729      0.23  Q V       |         |         |         |
4+30       0.0745      0.23  Q V       |         |         |         |
4+35       0.0760      0.23  Q  V      |         |         |         |
4+40       0.0776      0.23  Q  V      |         |         |         |
4+45       0.0792      0.23  Q  V      |         |         |         |
4+50       0.0808      0.23  Q  V      |         |         |         |
4+55       0.0824      0.23  Q  V      |         |         |         |
5+ 0       0.0841      0.23  Q  V      |         |         |         |
5+ 5       0.0857      0.24  Q  V      |         |         |         |
5+10       0.0873      0.24  Q  V      |         |         |         |
5+15       0.0890      0.24  Q  V      |         |         |         |
5+20       0.0906      0.24  Q  V      |         |         |         |
5+25       0.0923      0.24  Q  V      |         |         |         |
5+30       0.0939      0.24  Q  V      |         |         |         |
5+35       0.0956      0.24  Q  V      |         |         |         |
5+40       0.0973      0.24  Q  V      |         |         |         |
5+45       0.0990      0.25  Q  V      |         |         |         |
5+50       0.1007      0.25  Q   V     |         |         |         |
5+55       0.1024      0.25  Q   V     |         |         |         |
6+ 0       0.1041      0.25  Q   V     |         |         |         |
6+ 5       0.1058      0.25  |Q  V     |         |         |         |
6+10       0.1075      0.25  |Q  V     |         |         |         |
6+15       0.1093      0.25  |Q  V     |         |         |         |
6+20       0.1110      0.25  |Q  V     |         |         |         |
6+25       0.1128      0.26  |Q  V     |         |         |         |
6+30       0.1146      0.26  |Q  V     |         |         |         |
6+35       0.1163      0.26  |Q  V     |         |         |         |
6+40       0.1181      0.26  |Q  V     |         |         |         |
6+45       0.1199      0.26  |Q  V     |         |         |         |
6+50       0.1217      0.26  |Q  V     |         |         |         |
6+55       0.1235      0.26  |Q  V     |         |         |         |
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 7+ 0       0.1254      0.27  |Q   V    |         |         |         |
 7+ 5       0.1272      0.27  |Q   V    |         |         |         |
 7+10       0.1291      0.27  |Q   V    |         |         |         |
 7+15       0.1309      0.27  |Q   V    |         |         |         |
 7+20       0.1328      0.27  |Q   V    |         |         |         |
 7+25       0.1347      0.27  |Q   V    |         |         |         |
 7+30       0.1365      0.27  |Q   V    |         |         |         |
 7+35       0.1385      0.28  |Q   V    |         |         |         |
 7+40       0.1404      0.28  |Q   V    |         |         |         |
 7+45       0.1423      0.28  |Q   V    |         |         |         |
 7+50       0.1442      0.28  |Q   V    |         |         |         |
 7+55       0.1462      0.28  |Q   V    |         |         |         |
 8+ 0       0.1481      0.28  |Q   V    |         |         |         |
 8+ 5       0.1501      0.29  |Q    V   |         |         |         |
 8+10       0.1521      0.29  |Q    V   |         |         |         |
 8+15       0.1541      0.29  |Q    V   |         |         |         |
 8+20       0.1561      0.29  |Q    V   |         |         |         |
 8+25       0.1581      0.29  |Q    V   |         |         |         |
 8+30       0.1602      0.30  |Q    V   |         |         |         |
 8+35       0.1622      0.30  |Q    V   |         |         |         |
 8+40       0.1643      0.30  |Q    V   |         |         |         |
 8+45       0.1664      0.30  |Q    V   |         |         |         |
 8+50       0.1685      0.30  |Q    V   |         |         |         |
 8+55       0.1706      0.31  |Q    V   |         |         |         |
 9+ 0       0.1727      0.31  |Q    V   |         |         |         |
 9+ 5       0.1748      0.31  |Q     V  |         |         |         |
 9+10       0.1770      0.31  |Q     V  |         |         |         |
 9+15       0.1791      0.32  |Q     V  |         |         |         |
 9+20       0.1813      0.32  |Q     V  |         |         |         |
 9+25       0.1835      0.32  |Q     V  |         |         |         |
 9+30       0.1858      0.32  |Q     V  |         |         |         |
 9+35       0.1880      0.32  |Q     V  |         |         |         |
 9+40       0.1902      0.33  |Q     V  |         |         |         |
 9+45       0.1925      0.33  |Q     V  |         |         |         |
 9+50       0.1948      0.33  |Q     V  |         |         |         |
 9+55       0.1971      0.34  |Q     V  |         |         |         |
10+ 0       0.1994      0.34  |Q     V  |         |         |         |
10+ 5       0.2018      0.34  |Q      V |         |         |         |
10+10       0.2042      0.34  |Q      V |         |         |         |
10+15       0.2065      0.35  |Q      V |         |         |         |
10+20       0.2090      0.35  |Q      V |         |         |         |
10+25       0.2114      0.35  |Q      V |         |         |         |
10+30       0.2138      0.36  |Q      V |         |         |         |
10+35       0.2163      0.36  |Q      V |         |         |         |
10+40       0.2188      0.36  |Q      V |         |         |         |
10+45       0.2213      0.37  |Q      V |         |         |         |
10+50       0.2239      0.37  |Q      V |         |         |         |
10+55       0.2264      0.37  |Q       V|         |         |         |
11+ 0       0.2290      0.38  |Q       V|         |         |         |
11+ 5       0.2317      0.38  |Q       V|         |         |         |
11+10       0.2343      0.38  |Q       V|         |         |         |
11+15       0.2370      0.39  |Q       V|         |         |         |
11+20       0.2397      0.39  |Q       V|         |         |         |
11+25       0.2424      0.40  |Q       V|         |         |         |
11+30       0.2452      0.40  |Q       V|         |         |         |
11+35       0.2480      0.41  |Q       V|         |         |         |
11+40       0.2508      0.41  |Q        V         |         |         |
11+45       0.2536      0.41  |Q        V         |         |         |
11+50       0.2565      0.42  |Q        V         |         |         |
11+55       0.2594      0.42  |Q        V         |         |         |
12+ 0       0.2624      0.43  |Q        V         |         |         |
12+ 5       0.2655      0.45  |Q        V         |         |         |
12+10       0.2691      0.52  | Q       V         |         |         |
12+15       0.2733      0.61  | Q       V         |         |         |
12+20       0.2777      0.65  | Q       |V        |         |         |
12+25       0.2823      0.66  | Q       |V        |         |         |
12+30       0.2869      0.67  | Q       |V        |         |         |
12+35       0.2915      0.68  | Q       |V        |         |         |
12+40       0.2962      0.68  | Q       |V        |         |         |
12+45       0.3010      0.69  | Q       | V       |         |         |
12+50       0.3058      0.70  | Q       | V       |         |         |
12+55       0.3107      0.71  | Q       | V       |         |         |
13+ 0       0.3156      0.71  | Q       | V       |         |         |
```

```
13+ 5       0.3206      0.72  | Q       | V       |         |         |
13+10       0.3256      0.73  | Q       |  V      |         |         |
13+15       0.3307      0.74  | Q       |  V      |         |         |
13+20       0.3359      0.75  | Q       |  V      |         |         |
13+25       0.3411      0.76  |  Q      |  V      |         |         |
13+30       0.3464      0.77  |  Q      |  V      |         |         |
13+35       0.3518      0.78  |  Q      |   V     |         |         |
13+40       0.3572      0.79  |  Q      |   V     |         |         |
13+45       0.3627      0.80  |  Q      |   V     |         |         |
13+50       0.3684      0.81  |  Q      |   V     |         |         |
13+55       0.3741      0.83  |  Q      |   V     |         |         |
14+ 0       0.3798      0.84  |  Q      |    V    |         |         |
14+ 5       0.3857      0.86  |  Q      |    V    |         |         |
14+10       0.3917      0.87  |  Q      |    V    |         |         |
14+15       0.3978      0.89  |  Q      |    V    |         |         |
14+20       0.4041      0.90  |  Q      |     V   |         |         |
14+25       0.4104      0.92  |  Q      |     V   |         |         |
14+30       0.4169      0.94  |  Q      |     V   |         |         |
14+35       0.4235      0.96  |  Q      |     V   |         |         |
14+40       0.4303      0.98  |  Q      |      V  |         |         |
14+45       0.4372      1.01  |   Q     |      V  |         |         |
14+50       0.4444      1.03  |   Q     |      V  |         |         |
14+55       0.4517      1.06  |   Q     |       V |         |         |
15+ 0       0.4592      1.09  |   Q     |       V |         |         |
15+ 5       0.4670      1.13  |   Q     |       V |         |         |
15+10       0.4750      1.17  |   Q     |        V|         |         |
15+15       0.4834      1.21  |   Q     |        V|         |         |
15+20       0.4921      1.26  |    Q    |        V|         |         |
15+25       0.5010      1.29  |    Q    |         V         |         |
15+30       0.5094      1.22  |   Q     |         V         |         |
15+35       0.5172      1.13  |   Q     |         V         |         |
15+40       0.5252      1.17  |   Q     |         |V        |         |
15+45       0.5340      1.27  |    Q    |         |V        |         |
15+50       0.5439      1.44  |    Q    |         |V        |         |
15+55       0.5555      1.69  |     Q   |         | V       |         |
16+ 0       0.5702      2.14  |       Q |         | V       |         |
16+ 5       0.5943      3.49  |         |  Q      |  V      |         |
16+10       0.6416      6.87  |         |         |    V Q  |         |
16+15       0.6922      7.36  |         |         |      V Q|         |
16+20       0.7183      3.78  |         |    Q    |       V |         |
16+25       0.7320      1.99  |      Q  |         |        V|         |
16+30       0.7423      1.49  |    Q    |         |        V|         |
16+35       0.7518      1.38  |    Q    |         |         V         |
16+40       0.7604      1.25  |    Q    |         |         V         |
16+45       0.7685      1.17  |   Q     |         |         V         |
16+50       0.7760      1.10  |   Q     |         |         |V        |
16+55       0.7832      1.04  |   Q     |         |         |V        |
17+ 0       0.7900      0.99  |  Q      |         |         |V        |
17+ 5       0.7965      0.94  |  Q      |         |         |V        |
17+10       0.8027      0.91  |  Q      |         |         | V       |
17+15       0.8087      0.87  |  Q      |         |         | V       |
17+20       0.8145      0.84  |  Q      |         |         | V       |
17+25       0.8201      0.82  |  Q      |         |         | V       |
17+30       0.8256      0.79  |  Q      |         |         |  V      |
17+35       0.8309      0.77  |  Q      |         |         |  V      |
17+40       0.8360      0.75  | Q       |         |         |  V      |
17+45       0.8411      0.73  | Q       |         |         |  V      |
17+50       0.8460      0.71  | Q       |         |         |  V      |
17+55       0.8508      0.70  | Q       |         |         |   V     |
18+ 0       0.8555      0.68  | Q       |         |         |   V     |
18+ 5       0.8601      0.66  | Q       |         |         |   V     |
18+10       0.8640      0.58  | Q       |         |         |   V     |
18+15       0.8674      0.48  |Q        |         |         |   V     |
18+20       0.8704      0.44  |Q        |         |         |   V     |
18+25       0.8733      0.42  |Q        |         |         |   V     |
18+30       0.8761      0.41  |Q        |         |         |    V    |
18+35       0.8789      0.40  |Q        |         |         |    V    |
18+40       0.8816      0.39  |Q        |         |         |    V    |
18+45       0.8843      0.38  |Q        |         |         |    V    |
18+50       0.8868      0.38  |Q        |         |         |    V    |
18+55       0.8894      0.37  |Q        |         |         |    V    |
19+ 0       0.8919      0.36  |Q        |         |         |    V    |
19+ 5       0.8943      0.36  |Q        |         |         |    V    |
```

```
   19+10       0.8967      0.35  |Q        |         |         |    V    |
   19+15       0.8991      0.34  |Q        |         |         |     V   |
   19+20       0.9014      0.34  |Q        |         |         |     V   |
   19+25       0.9037      0.33  |Q        |         |         |     V   |
   19+30       0.9060      0.33  |Q        |         |         |     V   |
   19+35       0.9082      0.32  |Q        |         |         |     V   |
   19+40       0.9104      0.32  |Q        |         |         |     V   |
   19+45       0.9126      0.31  |Q        |         |         |     V   |
   19+50       0.9147      0.31  |Q        |         |         |     V   |
   19+55       0.9168      0.30  |Q        |         |         |     V   |
   20+ 0       0.9188      0.30  |Q        |         |         |     V   |
   20+ 5       0.9209      0.30  |Q        |         |         |     V   |
   20+10       0.9229      0.29  |Q        |         |         |     V   |
   20+15       0.9249      0.29  |Q        |         |         |      V  |
   20+20       0.9268      0.28  |Q        |         |         |      V  |
   20+25       0.9288      0.28  |Q        |         |         |      V  |
   20+30       0.9307      0.28  |Q        |         |         |      V  |
   20+35       0.9326      0.27  |Q        |         |         |      V  |
   20+40       0.9344      0.27  |Q        |         |         |      V  |
   20+45       0.9363      0.27  |Q        |         |         |      V  |
   20+50       0.9381      0.27  |Q        |         |         |      V  |
   20+55       0.9399      0.26  |Q        |         |         |      V  |
   21+ 0       0.9417      0.26  |Q        |         |         |      V  |
   21+ 5       0.9435      0.26  |Q        |         |         |      V  |
   21+10       0.9452      0.25  |Q        |         |         |      V  |
   21+15       0.9470      0.25  |Q        |         |         |      V  |
   21+20       0.9487      0.25  Q         |         |         |      V  |
   21+25       0.9504      0.25  Q         |         |         |       V |
   21+30       0.9520      0.24  Q         |         |         |       V |
   21+35       0.9537      0.24  Q         |         |         |       V |
   21+40       0.9554      0.24  Q         |         |         |       V |
   21+45       0.9570      0.24  Q         |         |         |       V |
   21+50       0.9586      0.23  Q         |         |         |       V |
   21+55       0.9602      0.23  Q         |         |         |       V |
   22+ 0       0.9618      0.23  Q         |         |         |       V |
   22+ 5       0.9634      0.23  Q         |         |         |       V |
   22+10       0.9649      0.23  Q         |         |         |       V |
   22+15       0.9665      0.22  Q         |         |         |       V |
   22+20       0.9680      0.22  Q         |         |         |       V |
   22+25       0.9695      0.22  Q         |         |         |       V |
   22+30       0.9711      0.22  Q         |         |         |       V |
   22+35       0.9726      0.22  Q         |         |         |       V |
   22+40       0.9740      0.22  Q         |         |         |        V|
   22+45       0.9755      0.21  Q         |         |         |        V|
   22+50       0.9770      0.21  Q         |         |         |        V|
   22+55       0.9784      0.21  Q         |         |         |        V|
   23+ 0       0.9799      0.21  Q         |         |         |        V|
   23+ 5       0.9813      0.21  Q         |         |         |        V|
   23+10       0.9827      0.21  Q         |         |         |        V|
   23+15       0.9841      0.20  Q         |         |         |        V|
   23+20       0.9855      0.20  Q         |         |         |        V|
   23+25       0.9869      0.20  Q         |         |         |        V|
   23+30       0.9883      0.20  Q         |         |         |        V|
   23+35       0.9897      0.20  Q         |         |         |        V|
   23+40       0.9910      0.20  Q         |         |         |        V|
   23+45       0.9924      0.20  Q         |         |         |        V|
   23+50       0.9937      0.19  Q         |         |         |        V|
   23+55       0.9950      0.19  Q         |         |         |        V|
   24+ 0       0.9964      0.19  Q         |         |         |        V|
   24+ 5       0.9976      0.18  Q         |         |         |        V|
   24+10       0.9984      0.12  Q         |         |         |        V|
   24+15       0.9987      0.04  Q         |         |         |        V|
   24+20       0.9987      0.01  Q         |         |         |        V|
   24+25       0.9988      0.00  Q         |         |         |        V|
   24+30       0.9988      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

        Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018, Version 9.0

                Study date  03/23/21


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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San Bernardino County Synthetic Unit Hydrology Method
                Manual date - August 1986


Program License Serial Number 6320

---------------------------------------------------------------------
204828 - TEC EQUIPMENT 776 MILL ST
DEVELOPED CONDITIONS
10-YEAR, 24-HOUR STORM
BY: JTS  DATE: 03-23-21
--------------------------------------------------------------------

        Storm Event Year = 10

        Antecedent Moisture Condition = 2

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format




Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 10
             7.01            1           0.83
--------------------------------------------------------------------
Rainfall data for year 2
             7.01            6           1.41
--------------------------------------------------------------------
Rainfall data for year 2
             7.01           24           2.40
--------------------------------------------------------------------
Rainfall data for year 100
             7.01            1           1.28
--------------------------------------------------------------------
Rainfall data for year 100
             7.01            6           2.60
--------------------------------------------------------------------
Rainfall data for year 100
             7.01           24           5.90
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 2)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 32.0      32.0          7.01      1.000     0.978    0.230    0.225

Area-averaged adjusted loss rate Fm (In/Hr) =  0.225

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
```

```
     1.61   0.230         32.0      32.0      19.20     0.000
     5.40   0.770         98.0      98.0       0.20     0.939

Area-averaged catchment yield fraction, Y =  0.723
Area-averaged low loss fraction, Yb =  0.277
User entry of time of concentration  =   0.180 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       7.01(Ac.)
Catchment Lag time =   0.144 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 57.8704
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.225(In/Hr)
Average low loss rate fraction (Yb) = 0.277 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.307(In)
Computed peak 30-minute rainfall =  0.629(In)
Specified peak 1-hour rainfall =  0.830(In)
Computed peak 3-hour rainfall =  1.379(In)
Specified peak 6-hour rainfall =  1.900(In)
Specified peak 24-hour rainfall =  3.840(In)


Rainfall depth area reduction factors:
Using a total area of       7.01(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.307(In)
30-minute factor = 1.000    Adjusted rainfall =  0.629(In)
1-hour factor = 1.000       Adjusted rainfall =  0.830(In)
3-hour factor = 1.000       Adjusted rainfall =  1.379(In)
6-hour factor = 1.000       Adjusted rainfall =  1.900(In)
24-hour factor = 1.000      Adjusted rainfall =  3.840(In)
---------------------------------------------------------------------

                        U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values            ((CFS))
---------------------------------------------------------------------
                (K =        84.78 (CFS))

  1                6.077                  5.152
  2               39.009                 27.919
  3               79.564                 34.381
  4               94.634                 12.776
  5               98.466                  3.248
  6               99.524                  0.897
  7              100.000                  0.404
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number              (In)                (In)
  1              0.3071               0.3071
  2              0.4052               0.0981
  3              0.4766               0.0713
  4              0.5347               0.0581
  5              0.5846               0.0499
  6              0.6288               0.0442
  7              0.6688               0.0400
  8              0.7055               0.0367
  9              0.7395               0.0340
 10              0.7714               0.0318
 11              0.8013               0.0300
 12              0.8297               0.0284
 13              0.8610               0.0313
 14              0.8910               0.0300
 15              0.9199               0.0289
 16              0.9478               0.0279
 17              0.9747               0.0269
 18              1.0008               0.0261
 19              1.0261               0.0253
 20              1.0508               0.0246
 21              1.0747               0.0240
 22              1.0981               0.0234
```

23	1.1209	0.0228
24	1.1432	0.0223
25	1.1650	0.0218
26	1.1863	0.0213
27	1.2072	0.0209
28	1.2276	0.0205
29	1.2477	0.0201
30	1.2674	0.0197
31	1.2868	0.0194
32	1.3058	0.0190
33	1.3245	0.0187
34	1.3429	0.0184
35	1.3611	0.0181
36	1.3789	0.0178
37	1.3965	0.0176
38	1.4138	0.0173
39	1.4309	0.0171
40	1.4477	0.0168
41	1.4643	0.0166
42	1.4807	0.0164
43	1.4969	0.0162
44	1.5129	0.0160
45	1.5287	0.0158
46	1.5443	0.0156
47	1.5597	0.0154
48	1.5750	0.0152
49	1.5900	0.0151
50	1.6050	0.0149
51	1.6197	0.0148
52	1.6343	0.0146
53	1.6488	0.0144
54	1.6631	0.0143
55	1.6772	0.0142
56	1.6913	0.0140
57	1.7051	0.0139
58	1.7189	0.0138
59	1.7325	0.0136
60	1.7460	0.0135
61	1.7594	0.0134
62	1.7727	0.0133
63	1.7859	0.0132
64	1.7989	0.0130
65	1.8118	0.0129
66	1.8247	0.0128
67	1.8374	0.0127
68	1.8500	0.0126
69	1.8625	0.0125
70	1.8750	0.0124
71	1.8873	0.0123
72	1.8995	0.0122
73	1.9129	0.0133
74	1.9261	0.0133
75	1.9393	0.0132
76	1.9524	0.0131
77	1.9654	0.0130
78	1.9783	0.0129
79	1.9912	0.0128
80	2.0039	0.0128
81	2.0166	0.0127
82	2.0292	0.0126
83	2.0417	0.0125
84	2.0542	0.0125
85	2.0666	0.0124
86	2.0789	0.0123
87	2.0911	0.0122
88	2.1033	0.0122
89	2.1154	0.0121
90	2.1274	0.0120
91	2.1394	0.0120
92	2.1513	0.0119
93	2.1631	0.0118
94	2.1749	0.0118
95	2.1866	0.0117

96	2.1983	0.0117
97	2.2099	0.0116
98	2.2214	0.0115
99	2.2329	0.0115
100	2.2443	0.0114
101	2.2557	0.0114
102	2.2670	0.0113
103	2.2782	0.0113
104	2.2894	0.0112
105	2.3006	0.0112
106	2.3117	0.0111
107	2.3227	0.0110
108	2.3337	0.0110
109	2.3447	0.0109
110	2.3556	0.0109
111	2.3664	0.0108
112	2.3772	0.0108
113	2.3880	0.0108
114	2.3987	0.0107
115	2.4093	0.0107
116	2.4200	0.0106
117	2.4305	0.0106
118	2.4410	0.0105
119	2.4515	0.0105
120	2.4620	0.0104
121	2.4724	0.0104
122	2.4827	0.0104
123	2.4930	0.0103
124	2.5033	0.0103
125	2.5135	0.0102
126	2.5237	0.0102
127	2.5339	0.0101
128	2.5440	0.0101
129	2.5540	0.0101
130	2.5641	0.0100
131	2.5741	0.0100
132	2.5840	0.0100
133	2.5940	0.0099
134	2.6038	0.0099
135	2.6137	0.0098
136	2.6235	0.0098
137	2.6333	0.0098
138	2.6430	0.0097
139	2.6527	0.0097
140	2.6624	0.0097
141	2.6720	0.0096
142	2.6816	0.0096
143	2.6912	0.0096
144	2.7007	0.0095
145	2.7102	0.0095
146	2.7197	0.0095
147	2.7292	0.0094
148	2.7386	0.0094
149	2.7480	0.0094
150	2.7573	0.0093
151	2.7666	0.0093
152	2.7759	0.0093
153	2.7852	0.0093
154	2.7944	0.0092
155	2.8036	0.0092
156	2.8128	0.0092
157	2.8219	0.0091
158	2.8310	0.0091
159	2.8401	0.0091
160	2.8491	0.0091
161	2.8582	0.0090
162	2.8672	0.0090
163	2.8761	0.0090
164	2.8851	0.0089
165	2.8940	0.0089
166	2.9029	0.0089
167	2.9118	0.0089
168	2.9206	0.0088

169	2.9294	0.0088
170	2.9382	0.0088
171	2.9470	0.0088
172	2.9557	0.0087
173	2.9644	0.0087
174	2.9731	0.0087
175	2.9818	0.0087
176	2.9904	0.0086
177	2.9990	0.0086
178	3.0076	0.0086
179	3.0162	0.0086
180	3.0247	0.0085
181	3.0332	0.0085
182	3.0417	0.0085
183	3.0502	0.0085
184	3.0587	0.0085
185	3.0671	0.0084
186	3.0755	0.0084
187	3.0839	0.0084
188	3.0922	0.0084
189	3.1006	0.0083
190	3.1089	0.0083
191	3.1172	0.0083
192	3.1255	0.0083
193	3.1337	0.0083
194	3.1420	0.0082
195	3.1502	0.0082
196	3.1584	0.0082
197	3.1665	0.0082
198	3.1747	0.0082
199	3.1828	0.0081
200	3.1909	0.0081
201	3.1990	0.0081
202	3.2071	0.0081
203	3.2151	0.0081
204	3.2232	0.0080
205	3.2312	0.0080
206	3.2392	0.0080
207	3.2472	0.0080
208	3.2551	0.0080
209	3.2630	0.0079
210	3.2710	0.0079
211	3.2789	0.0079
212	3.2867	0.0079
213	3.2946	0.0079
214	3.3024	0.0078
215	3.3103	0.0078
216	3.3181	0.0078
217	3.3259	0.0078
218	3.3336	0.0078
219	3.3414	0.0078
220	3.3491	0.0077
221	3.3569	0.0077
222	3.3646	0.0077
223	3.3722	0.0077
224	3.3799	0.0077
225	3.3876	0.0077
226	3.3952	0.0076
227	3.4028	0.0076
228	3.4104	0.0076
229	3.4180	0.0076
230	3.4256	0.0076
231	3.4331	0.0076
232	3.4407	0.0075
233	3.4482	0.0075
234	3.4557	0.0075
235	3.4632	0.0075
236	3.4707	0.0075
237	3.4781	0.0075
238	3.4856	0.0074
239	3.4930	0.0074
240	3.5004	0.0074
241	3.5078	0.0074

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242               3.5152               0.0074
243               3.5226               0.0074
244               3.5299               0.0074
245               3.5372               0.0073
246               3.5446               0.0073
247               3.5519               0.0073
248               3.5592               0.0073
249               3.5664               0.0073
250               3.5737               0.0073
251               3.5810               0.0073
252               3.5882               0.0072
253               3.5954               0.0072
254               3.6026               0.0072
255               3.6098               0.0072
256               3.6170               0.0072
257               3.6242               0.0072
258               3.6313               0.0072
259               3.6385               0.0071
260               3.6456               0.0071
261               3.6527               0.0071
262               3.6598               0.0071
263               3.6669               0.0071
264               3.6740               0.0071
265               3.6810               0.0071
266               3.6881               0.0070
267               3.6951               0.0070
268               3.7021               0.0070
269               3.7091               0.0070
270               3.7161               0.0070
271               3.7231               0.0070
272               3.7301               0.0070
273               3.7370               0.0070
274               3.7440               0.0069
275               3.7509               0.0069
276               3.7578               0.0069
277               3.7647               0.0069
278               3.7716               0.0069
279               3.7785               0.0069
280               3.7854               0.0069
281               3.7922               0.0069
282               3.7991               0.0068
283               3.8059               0.0068
284               3.8127               0.0068
285               3.8195               0.0068
286               3.8263               0.0068
287               3.8331               0.0068
288               3.8399               0.0068
---------------------------------------------------------------------
Unit              Unit            Unit              Effective
Period            Rainfall        Soil-Loss         Rainfall
(number)            (In)          (In)                (In)
---------------------------------------------------------------------
  1              0.0068           0.0019              0.0049
  2              0.0068           0.0019              0.0049
  3              0.0068           0.0019              0.0049
  4              0.0068           0.0019              0.0049
  5              0.0068           0.0019              0.0049
  6              0.0069           0.0019              0.0050
  7              0.0069           0.0019              0.0050
  8              0.0069           0.0019              0.0050
  9              0.0069           0.0019              0.0050
 10              0.0069           0.0019              0.0050
 11              0.0070           0.0019              0.0050
 12              0.0070           0.0019              0.0050
 13              0.0070           0.0019              0.0051
 14              0.0070           0.0019              0.0051
 15              0.0070           0.0019              0.0051
 16              0.0070           0.0020              0.0051
 17              0.0071           0.0020              0.0051
 18              0.0071           0.0020              0.0051
 19              0.0071           0.0020              0.0051
 20              0.0071           0.0020              0.0052
 21              0.0072           0.0020              0.0052
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22	0.0072	0.0020	0.0052
23	0.0072	0.0020	0.0052
24	0.0072	0.0020	0.0052
25	0.0072	0.0020	0.0052
26	0.0073	0.0020	0.0052
27	0.0073	0.0020	0.0053
28	0.0073	0.0020	0.0053
29	0.0073	0.0020	0.0053
30	0.0073	0.0020	0.0053
31	0.0074	0.0020	0.0053
32	0.0074	0.0020	0.0053
33	0.0074	0.0021	0.0054
34	0.0074	0.0021	0.0054
35	0.0075	0.0021	0.0054
36	0.0075	0.0021	0.0054
37	0.0075	0.0021	0.0054
38	0.0075	0.0021	0.0054
39	0.0076	0.0021	0.0055
40	0.0076	0.0021	0.0055
41	0.0076	0.0021	0.0055
42	0.0076	0.0021	0.0055
43	0.0077	0.0021	0.0055
44	0.0077	0.0021	0.0055
45	0.0077	0.0021	0.0056
46	0.0077	0.0021	0.0056
47	0.0078	0.0021	0.0056
48	0.0078	0.0022	0.0056
49	0.0078	0.0022	0.0056
50	0.0078	0.0022	0.0057
51	0.0079	0.0022	0.0057
52	0.0079	0.0022	0.0057
53	0.0079	0.0022	0.0057
54	0.0079	0.0022	0.0057
55	0.0080	0.0022	0.0058
56	0.0080	0.0022	0.0058
57	0.0080	0.0022	0.0058
58	0.0081	0.0022	0.0058
59	0.0081	0.0022	0.0058
60	0.0081	0.0022	0.0059
61	0.0082	0.0023	0.0059
62	0.0082	0.0023	0.0059
63	0.0082	0.0023	0.0059
64	0.0082	0.0023	0.0060
65	0.0083	0.0023	0.0060
66	0.0083	0.0023	0.0060
67	0.0083	0.0023	0.0060
68	0.0084	0.0023	0.0060
69	0.0084	0.0023	0.0061
70	0.0084	0.0023	0.0061
71	0.0085	0.0023	0.0061
72	0.0085	0.0024	0.0061
73	0.0085	0.0024	0.0062
74	0.0086	0.0024	0.0062
75	0.0086	0.0024	0.0062
76	0.0086	0.0024	0.0062
77	0.0087	0.0024	0.0063
78	0.0087	0.0024	0.0063
79	0.0088	0.0024	0.0063
80	0.0088	0.0024	0.0064
81	0.0088	0.0024	0.0064
82	0.0089	0.0025	0.0064
83	0.0089	0.0025	0.0064
84	0.0089	0.0025	0.0065
85	0.0090	0.0025	0.0065
86	0.0090	0.0025	0.0065
87	0.0091	0.0025	0.0066
88	0.0091	0.0025	0.0066
89	0.0092	0.0025	0.0066
90	0.0092	0.0025	0.0066
91	0.0093	0.0026	0.0067
92	0.0093	0.0026	0.0067
93	0.0093	0.0026	0.0068
94	0.0094	0.0026	0.0068

95	0.0094	0.0026	0.0068
96	0.0095	0.0026	0.0068
97	0.0095	0.0026	0.0069
98	0.0096	0.0027	0.0069
99	0.0096	0.0027	0.0070
100	0.0097	0.0027	0.0070
101	0.0097	0.0027	0.0070
102	0.0098	0.0027	0.0071
103	0.0098	0.0027	0.0071
104	0.0099	0.0027	0.0071
105	0.0100	0.0028	0.0072
106	0.0100	0.0028	0.0072
107	0.0101	0.0028	0.0073
108	0.0101	0.0028	0.0073
109	0.0102	0.0028	0.0074
110	0.0102	0.0028	0.0074
111	0.0103	0.0029	0.0075
112	0.0104	0.0029	0.0075
113	0.0104	0.0029	0.0075
114	0.0105	0.0029	0.0076
115	0.0106	0.0029	0.0076
116	0.0106	0.0029	0.0077
117	0.0107	0.0030	0.0077
118	0.0108	0.0030	0.0078
119	0.0108	0.0030	0.0078
120	0.0109	0.0030	0.0079
121	0.0110	0.0030	0.0079
122	0.0110	0.0031	0.0080
123	0.0112	0.0031	0.0081
124	0.0112	0.0031	0.0081
125	0.0113	0.0031	0.0082
126	0.0114	0.0031	0.0082
127	0.0115	0.0032	0.0083
128	0.0115	0.0032	0.0083
129	0.0117	0.0032	0.0084
130	0.0117	0.0032	0.0085
131	0.0118	0.0033	0.0086
132	0.0119	0.0033	0.0086
133	0.0120	0.0033	0.0087
134	0.0121	0.0034	0.0087
135	0.0122	0.0034	0.0088
136	0.0123	0.0034	0.0089
137	0.0125	0.0034	0.0090
138	0.0125	0.0035	0.0091
139	0.0127	0.0035	0.0092
140	0.0128	0.0035	0.0092
141	0.0129	0.0036	0.0093
142	0.0130	0.0036	0.0094
143	0.0132	0.0036	0.0095
144	0.0133	0.0037	0.0096
145	0.0122	0.0034	0.0088
146	0.0123	0.0034	0.0089
147	0.0125	0.0035	0.0091
148	0.0126	0.0035	0.0091
149	0.0128	0.0036	0.0093
150	0.0129	0.0036	0.0094
151	0.0132	0.0036	0.0095
152	0.0133	0.0037	0.0096
153	0.0135	0.0037	0.0098
154	0.0136	0.0038	0.0099
155	0.0139	0.0038	0.0100
156	0.0140	0.0039	0.0101
157	0.0143	0.0040	0.0103
158	0.0144	0.0040	0.0104
159	0.0148	0.0041	0.0107
160	0.0149	0.0041	0.0108
161	0.0152	0.0042	0.0110
162	0.0154	0.0043	0.0112
163	0.0158	0.0044	0.0114
164	0.0160	0.0044	0.0116
165	0.0164	0.0045	0.0119
166	0.0166	0.0046	0.0120
167	0.0171	0.0047	0.0123

168	0.0173	0.0048	0.0125
169	0.0178	0.0049	0.0129
170	0.0181	0.0050	0.0131
171	0.0187	0.0052	0.0135
172	0.0190	0.0053	0.0138
173	0.0197	0.0055	0.0143
174	0.0201	0.0056	0.0145
175	0.0209	0.0058	0.0151
176	0.0213	0.0059	0.0154
177	0.0223	0.0062	0.0161
178	0.0228	0.0063	0.0165
179	0.0240	0.0066	0.0173
180	0.0246	0.0068	0.0178
181	0.0261	0.0072	0.0189
182	0.0269	0.0075	0.0195
183	0.0289	0.0080	0.0209
184	0.0300	0.0083	0.0217
185	0.0284	0.0079	0.0205
186	0.0300	0.0083	0.0217
187	0.0340	0.0094	0.0246
188	0.0367	0.0102	0.0265
189	0.0442	0.0123	0.0320
190	0.0499	0.0138	0.0361
191	0.0713	0.0187	0.0526
192	0.0981	0.0187	0.0794
193	0.3071	0.0187	0.2883
194	0.0581	0.0161	0.0420
195	0.0400	0.0111	0.0289
196	0.0318	0.0088	0.0230
197	0.0313	0.0087	0.0226
198	0.0279	0.0077	0.0201
199	0.0253	0.0070	0.0183
200	0.0234	0.0065	0.0169
201	0.0218	0.0060	0.0157
202	0.0205	0.0057	0.0148
203	0.0194	0.0054	0.0140
204	0.0184	0.0051	0.0133
205	0.0176	0.0049	0.0127
206	0.0168	0.0047	0.0122
207	0.0162	0.0045	0.0117
208	0.0156	0.0043	0.0113
209	0.0151	0.0042	0.0109
210	0.0146	0.0040	0.0106
211	0.0142	0.0039	0.0102
212	0.0138	0.0038	0.0099
213	0.0134	0.0037	0.0097
214	0.0130	0.0036	0.0094
215	0.0127	0.0035	0.0092
216	0.0124	0.0034	0.0090
217	0.0133	0.0037	0.0097
218	0.0131	0.0036	0.0095
219	0.0128	0.0036	0.0093
220	0.0126	0.0035	0.0091
221	0.0124	0.0034	0.0090
222	0.0122	0.0034	0.0088
223	0.0120	0.0033	0.0087
224	0.0118	0.0033	0.0085
225	0.0116	0.0032	0.0084
226	0.0114	0.0032	0.0083
227	0.0113	0.0031	0.0081
228	0.0111	0.0031	0.0080
229	0.0109	0.0030	0.0079
230	0.0108	0.0030	0.0078
231	0.0107	0.0030	0.0077
232	0.0105	0.0029	0.0076
233	0.0104	0.0029	0.0075
234	0.0103	0.0028	0.0074
235	0.0101	0.0028	0.0073
236	0.0100	0.0028	0.0073
237	0.0099	0.0027	0.0072
238	0.0098	0.0027	0.0071
239	0.0097	0.0027	0.0070
240	0.0096	0.0027	0.0069

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      241              0.0095           0.0026              0.0069
      242              0.0094           0.0026              0.0068
      243              0.0093           0.0026              0.0067
      244              0.0092           0.0026              0.0067
      245              0.0091           0.0025              0.0066
      246              0.0091           0.0025              0.0065
      247              0.0090           0.0025              0.0065
      248              0.0089           0.0025              0.0064
      249              0.0088           0.0024              0.0064
      250              0.0087           0.0024              0.0063
      251              0.0087           0.0024              0.0063
      252              0.0086           0.0024              0.0062
      253              0.0085           0.0024              0.0062
      254              0.0085           0.0023              0.0061
      255              0.0084           0.0023              0.0061
      256              0.0083           0.0023              0.0060
      257              0.0083           0.0023              0.0060
      258              0.0082           0.0023              0.0059
      259              0.0081           0.0023              0.0059
      260              0.0081           0.0022              0.0058
      261              0.0080           0.0022              0.0058
      262              0.0080           0.0022              0.0058
      263              0.0079           0.0022              0.0057
      264              0.0078           0.0022              0.0057
      265              0.0078           0.0022              0.0056
      266              0.0077           0.0021              0.0056
      267              0.0077           0.0021              0.0056
      268              0.0076           0.0021              0.0055
      269              0.0076           0.0021              0.0055
      270              0.0075           0.0021              0.0054
      271              0.0075           0.0021              0.0054
      272              0.0074           0.0021              0.0054
      273              0.0074           0.0020              0.0053
      274              0.0074           0.0020              0.0053
      275              0.0073           0.0020              0.0053
      276              0.0073           0.0020              0.0053
      277              0.0072           0.0020              0.0052
      278              0.0072           0.0020              0.0052
      279              0.0071           0.0020              0.0052
      280              0.0071           0.0020              0.0051
      281              0.0071           0.0020              0.0051
      282              0.0070           0.0019              0.0051
      283              0.0070           0.0019              0.0050
      284              0.0069           0.0019              0.0050
      285              0.0069           0.0019              0.0050
      286              0.0069           0.0019              0.0050
      287              0.0068           0.0019              0.0049
      288              0.0068           0.0019              0.0049
      --------------------------------------------------------------------
      --------------------------------------------------------------------
      Total soil rain loss =      0.99(In)
      Total effective rainfall =      2.85(In)
      Peak flow rate in flood hydrograph =     12.47(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        5.0      10.0      15.0      20.0
-----------------------------------------------------------------------
  0+ 5       0.0002      0.03  Q         |         |         |         |
  0+10       0.0013      0.16  Q         |         |         |         |
  0+15       0.0036      0.33  Q         |         |         |         |
  0+20       0.0063      0.39  Q         |         |         |         |
  0+25       0.0091      0.41  Q         |         |         |         |
  0+30       0.0120      0.42  Q         |         |         |         |
  0+35       0.0149      0.42  Q         |         |         |         |
  0+40       0.0178      0.42  Q         |         |         |         |
  0+45       0.0207      0.42  Q         |         |         |         |
  0+50       0.0236      0.42  Q         |         |         |         |
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0+55       0.0265      0.42  Q         |         |         |         |
1+ 0       0.0294      0.43  Q         |         |         |         |
1+ 5       0.0324      0.43  Q         |         |         |         |
1+10       0.0353      0.43  Q         |         |         |         |
1+15       0.0383      0.43  Q         |         |         |         |
1+20       0.0412      0.43  Q         |         |         |         |
1+25       0.0442      0.43  QV        |         |         |         |
1+30       0.0472      0.43  QV        |         |         |         |
1+35       0.0502      0.43  QV        |         |         |         |
1+40       0.0532      0.43  QV        |         |         |         |
1+45       0.0562      0.44  QV        |         |         |         |
1+50       0.0592      0.44  QV        |         |         |         |
1+55       0.0622      0.44  QV        |         |         |         |
2+ 0       0.0652      0.44  QV        |         |         |         |
2+ 5       0.0683      0.44  QV        |         |         |         |
2+10       0.0713      0.44  QV        |         |         |         |
2+15       0.0744      0.44  QV        |         |         |         |
2+20       0.0774      0.44  QV        |         |         |         |
2+25       0.0805      0.45  QV        |         |         |         |
2+30       0.0836      0.45  Q V       |         |         |         |
2+35       0.0867      0.45  Q V       |         |         |         |
2+40       0.0898      0.45  Q V       |         |         |         |
2+45       0.0929      0.45  Q V       |         |         |         |
2+50       0.0960      0.45  Q V       |         |         |         |
2+55       0.0991      0.45  Q V       |         |         |         |
3+ 0       0.1023      0.46  Q V       |         |         |         |
3+ 5       0.1054      0.46  Q V       |         |         |         |
3+10       0.1086      0.46  Q V       |         |         |         |
3+15       0.1117      0.46  Q V       |         |         |         |
3+20       0.1149      0.46  Q V       |         |         |         |
3+25       0.1181      0.46  Q V       |         |         |         |
3+30       0.1213      0.46  Q V       |         |         |         |
3+35       0.1245      0.47  Q V       |         |         |         |
3+40       0.1277      0.47  Q  V      |         |         |         |
3+45       0.1310      0.47  Q  V      |         |         |         |
3+50       0.1342      0.47  Q  V      |         |         |         |
3+55       0.1375      0.47  Q  V      |         |         |         |
4+ 0       0.1407      0.47  Q  V      |         |         |         |
4+ 5       0.1440      0.48  Q  V      |         |         |         |
4+10       0.1473      0.48  Q  V      |         |         |         |
4+15       0.1506      0.48  Q  V      |         |         |         |
4+20       0.1539      0.48  Q  V      |         |         |         |
4+25       0.1572      0.48  Q  V      |         |         |         |
4+30       0.1605      0.48  Q  V      |         |         |         |
4+35       0.1639      0.49  Q  V      |         |         |         |
4+40       0.1672      0.49  Q   V     |         |         |         |
4+45       0.1706      0.49  Q   V     |         |         |         |
4+50       0.1740      0.49  Q   V     |         |         |         |
4+55       0.1774      0.49  Q   V     |         |         |         |
5+ 0       0.1808      0.49  Q   V     |         |         |         |
5+ 5       0.1842      0.50  Q   V     |         |         |         |
5+10       0.1876      0.50  Q   V     |         |         |         |
5+15       0.1910      0.50  Q   V     |         |         |         |
5+20       0.1945      0.50  |Q  V     |         |         |         |
5+25       0.1980      0.50  |Q  V     |         |         |         |
5+30       0.2014      0.51  |Q  V     |         |         |         |
5+35       0.2049      0.51  |Q  V     |         |         |         |
5+40       0.2084      0.51  |Q   V    |         |         |         |
5+45       0.2120      0.51  |Q   V    |         |         |         |
5+50       0.2155      0.51  |Q   V    |         |         |         |
5+55       0.2191      0.52  |Q   V    |         |         |         |
6+ 0       0.2226      0.52  |Q   V    |         |         |         |
6+ 5       0.2262      0.52  |Q   V    |         |         |         |
6+10       0.2298      0.52  |Q   V    |         |         |         |
6+15       0.2334      0.52  |Q   V    |         |         |         |
6+20       0.2370      0.53  |Q   V    |         |         |         |
6+25       0.2406      0.53  |Q   V    |         |         |         |
6+30       0.2443      0.53  |Q   V    |         |         |         |
6+35       0.2480      0.53  |Q   V    |         |         |         |
6+40       0.2517      0.53  |Q    V   |         |         |         |
6+45       0.2553      0.54  |Q    V   |         |         |         |
6+50       0.2591      0.54  |Q    V   |         |         |         |
6+55       0.2628      0.54  |Q    V   |         |         |         |
```

```
 7+ 0       0.2665      0.54  |Q    V   |         |         |         |
 7+ 5       0.2703      0.55  |Q    V   |         |         |         |
 7+10       0.2741      0.55  |Q    V   |         |         |         |
 7+15       0.2779      0.55  |Q    V   |         |         |         |
 7+20       0.2817      0.55  |Q    V   |         |         |         |
 7+25       0.2855      0.56  |Q    V   |         |         |         |
 7+30       0.2894      0.56  |Q    V   |         |         |         |
 7+35       0.2933      0.56  |Q     V  |         |         |         |
 7+40       0.2972      0.56  |Q     V  |         |         |         |
 7+45       0.3011      0.57  |Q     V  |         |         |         |
 7+50       0.3050      0.57  |Q     V  |         |         |         |
 7+55       0.3089      0.57  |Q     V  |         |         |         |
 8+ 0       0.3129      0.58  |Q     V  |         |         |         |
 8+ 5       0.3169      0.58  |Q     V  |         |         |         |
 8+10       0.3209      0.58  |Q     V  |         |         |         |
 8+15       0.3249      0.58  |Q     V  |         |         |         |
 8+20       0.3290      0.59  |Q     V  |         |         |         |
 8+25       0.3330      0.59  |Q      V |         |         |         |
 8+30       0.3371      0.59  |Q      V |         |         |         |
 8+35       0.3412      0.60  |Q      V |         |         |         |
 8+40       0.3454      0.60  |Q      V |         |         |         |
 8+45       0.3495      0.60  |Q      V |         |         |         |
 8+50       0.3537      0.61  |Q      V |         |         |         |
 8+55       0.3579      0.61  |Q      V |         |         |         |
 9+ 0       0.3621      0.61  |Q      V |         |         |         |
 9+ 5       0.3664      0.62  |Q      V |         |         |         |
 9+10       0.3707      0.62  |Q      V |         |         |         |
 9+15       0.3750      0.62  |Q       V|         |         |         |
 9+20       0.3793      0.63  |Q       V|         |         |         |
 9+25       0.3836      0.63  |Q       V|         |         |         |
 9+30       0.3880      0.64  |Q       V|         |         |         |
 9+35       0.3924      0.64  |Q       V|         |         |         |
 9+40       0.3969      0.64  |Q       V|         |         |         |
 9+45       0.4013      0.65  |Q       V|         |         |         |
 9+50       0.4058      0.65  |Q       V|         |         |         |
 9+55       0.4103      0.66  |Q       V|         |         |         |
10+ 0       0.4149      0.66  |Q       V|         |         |         |
10+ 5       0.4195      0.66  |Q        V         |         |         |
10+10       0.4241      0.67  |Q        V         |         |         |
10+15       0.4287      0.67  |Q        V         |         |         |
10+20       0.4334      0.68  |Q        V         |         |         |
10+25       0.4381      0.68  |Q        V         |         |         |
10+30       0.4428      0.69  |Q        V         |         |         |
10+35       0.4476      0.69  |Q        V         |         |         |
10+40       0.4524      0.70  |Q        V         |         |         |
10+45       0.4573      0.70  |Q        V         |         |         |
10+50       0.4622      0.71  |Q        |V        |         |         |
10+55       0.4671      0.71  |Q        |V        |         |         |
11+ 0       0.4720      0.72  |Q        |V        |         |         |
11+ 5       0.4770      0.73  |Q        |V        |         |         |
11+10       0.4821      0.73  |Q        |V        |         |         |
11+15       0.4872      0.74  |Q        |V        |         |         |
11+20       0.4923      0.74  |Q        |V        |         |         |
11+25       0.4975      0.75  |Q        |V        |         |         |
11+30       0.5027      0.76  |Q        | V       |         |         |
11+35       0.5079      0.76  |Q        | V       |         |         |
11+40       0.5132      0.77  |Q        | V       |         |         |
11+45       0.5186      0.78  |Q        | V       |         |         |
11+50       0.5240      0.78  |Q        | V       |         |         |
11+55       0.5294      0.79  |Q        | V       |         |         |
12+ 0       0.5349      0.80  |Q        | V       |         |         |
12+ 5       0.5405      0.80  |Q        | V       |         |         |
12+10       0.5459      0.79  |Q        |  V      |         |         |
12+15       0.5512      0.77  |Q        |  V      |         |         |
12+20       0.5564      0.76  |Q        |  V      |         |         |
12+25       0.5617      0.77  |Q        |  V      |         |         |
12+30       0.5671      0.78  |Q        |  V      |         |         |
12+35       0.5725      0.79  |Q        |  V      |         |         |
12+40       0.5780      0.80  |Q        |  V      |         |         |
12+45       0.5835      0.81  |Q        |   V     |         |         |
12+50       0.5891      0.82  |Q        |   V     |         |         |
12+55       0.5949      0.83  |Q        |   V     |         |         |
13+ 0       0.6006      0.84  |Q        |   V     |         |         |
```

```
13+ 5       0.6065      0.85  |Q        |   V     |         |         |
13+10       0.6125      0.86  |Q        |   V     |         |         |
13+15       0.6185      0.88  |Q        |   V     |         |         |
13+20       0.6246      0.89  |Q        |    V    |         |         |
13+25       0.6309      0.90  |Q        |    V    |         |         |
13+30       0.6372      0.92  |Q        |    V    |         |         |
13+35       0.6436      0.94  |Q        |    V    |         |         |
13+40       0.6502      0.95  |Q        |    V    |         |         |
13+45       0.6569      0.97  |Q        |    V    |         |         |
13+50       0.6637      0.99  |Q        |    V    |         |         |
13+55       0.6706      1.01  | Q       |     V   |         |         |
14+ 0       0.6776      1.03  | Q       |     V   |         |         |
14+ 5       0.6849      1.05  | Q       |     V   |         |         |
14+10       0.6922      1.07  | Q       |     V   |         |         |
14+15       0.6998      1.09  | Q       |     V   |         |         |
14+20       0.7075      1.12  | Q       |     V   |         |         |
14+25       0.7154      1.15  | Q       |      V  |         |         |
14+30       0.7235      1.18  | Q       |      V  |         |         |
14+35       0.7318      1.21  | Q       |      V  |         |         |
14+40       0.7404      1.24  | Q       |      V  |         |         |
14+45       0.7492      1.28  | Q       |      V  |         |         |
14+50       0.7583      1.32  | Q       |       V |         |         |
14+55       0.7678      1.37  | Q       |       V |         |         |
15+ 0       0.7775      1.42  | Q       |       V |         |         |
15+ 5       0.7877      1.47  | Q       |       V |         |         |
15+10       0.7982      1.54  |  Q      |        V|         |         |
15+15       0.8093      1.61  |  Q      |        V|         |         |
15+20       0.8209      1.69  |  Q      |        V|         |         |
15+25       0.8330      1.76  |  Q      |         V         |         |
15+30       0.8453      1.78  |  Q      |         V         |         |
15+35       0.8578      1.81  |  Q      |         V         |         |
15+40       0.8711      1.93  |  Q      |         V         |         |
15+45       0.8857      2.12  |   Q     |         |V        |         |
15+50       0.9022      2.40  |   Q     |         |V        |         |
15+55       0.9217      2.82  |    Q    |         | V       |         |
16+ 0       0.9468      3.64  |      Q  |         | V       |         |
16+ 5       0.9888      6.11  |         | Q       |  V      |         |
16+10       1.0703     11.82  |         |         |  Q V    |         |
16+15       1.1561     12.47  |         |         |   Q  V  |         |
16+20       1.2000      6.37  |         | Q       |       V |         |
16+25       1.2229      3.32  |     Q   |         |        V|         |
16+30       1.2389      2.32  |   Q     |         |        V|         |
16+35       1.2525      1.98  |  Q      |         |         V         |
16+40       1.2642      1.70  |  Q      |         |         V         |
16+45       1.2748      1.55  |  Q      |         |         V         |
16+50       1.2847      1.43  | Q       |         |         V         |
16+55       1.2938      1.33  | Q       |         |         |V        |
17+ 0       1.3024      1.25  | Q       |         |         |V        |
17+ 5       1.3106      1.18  | Q       |         |         |V        |
17+10       1.3183      1.12  | Q       |         |         |V        |
17+15       1.3257      1.07  | Q       |         |         |V        |
17+20       1.3327      1.03  | Q       |         |         | V       |
17+25       1.3395      0.99  |Q        |         |         | V       |
17+30       1.3461      0.95  |Q        |         |         | V       |
17+35       1.3524      0.92  |Q        |         |         | V       |
17+40       1.3586      0.89  |Q        |         |         | V       |
17+45       1.3645      0.86  |Q        |         |         | V       |
17+50       1.3703      0.84  |Q        |         |         | V       |
17+55       1.3760      0.82  |Q        |         |         |  V      |
18+ 0       1.3814      0.80  |Q        |         |         |  V      |
18+ 5       1.3868      0.78  |Q        |         |         |  V      |
18+10       1.3923      0.79  |Q        |         |         |  V      |
18+15       1.3978      0.80  |Q        |         |         |  V      |
18+20       1.4033      0.80  |Q        |         |         |  V      |
18+25       1.4087      0.78  |Q        |         |         |  V      |
18+30       1.4140      0.77  |Q        |         |         |  V      |
18+35       1.4192      0.76  |Q        |         |         |   V     |
18+40       1.4243      0.74  |Q        |         |         |   V     |
18+45       1.4293      0.73  |Q        |         |         |   V     |
18+50       1.4343      0.72  |Q        |         |         |   V     |
18+55       1.4392      0.71  |Q        |         |         |   V     |
19+ 0       1.4440      0.70  |Q        |         |         |   V     |
19+ 5       1.4487      0.69  |Q        |         |         |   V     |
```

```
   19+10      1.4534      0.68  |Q        |         |         |   V     |
   19+15      1.4580      0.67  |Q        |         |         |    V    |
   19+20      1.4626      0.66  |Q        |         |         |    V    |
   19+25      1.4671      0.65  |Q        |         |         |    V    |
   19+30      1.4715      0.64  |Q        |         |         |    V    |
   19+35      1.4759      0.64  |Q        |         |         |    V    |
   19+40      1.4802      0.63  |Q        |         |         |    V    |
   19+45      1.4845      0.62  |Q        |         |         |    V    |
   19+50      1.4887      0.61  |Q        |         |         |    V    |
   19+55      1.4929      0.61  |Q        |         |         |    V    |
   20+ 0      1.4970      0.60  |Q        |         |         |    V    |
   20+ 5      1.5011      0.59  |Q        |         |         |     V   |
   20+10      1.5052      0.59  |Q        |         |         |     V   |
   20+15      1.5092      0.58  |Q        |         |         |     V   |
   20+20      1.5131      0.58  |Q        |         |         |     V   |
   20+25      1.5171      0.57  |Q        |         |         |     V   |
   20+30      1.5209      0.56  |Q        |         |         |     V   |
   20+35      1.5248      0.56  |Q        |         |         |     V   |
   20+40      1.5286      0.55  |Q        |         |         |     V   |
   20+45      1.5324      0.55  |Q        |         |         |     V   |
   20+50      1.5361      0.54  |Q        |         |         |     V   |
   20+55      1.5399      0.54  |Q        |         |         |     V   |
   21+ 0      1.5435      0.53  |Q        |         |         |      V  |
   21+ 5      1.5472      0.53  |Q        |         |         |      V  |
   21+10      1.5508      0.53  |Q        |         |         |      V  |
   21+15      1.5544      0.52  |Q        |         |         |      V  |
   21+20      1.5580      0.52  |Q        |         |         |      V  |
   21+25      1.5615      0.51  |Q        |         |         |      V  |
   21+30      1.5650      0.51  |Q        |         |         |      V  |
   21+35      1.5685      0.51  |Q        |         |         |      V  |
   21+40      1.5719      0.50  |Q        |         |         |      V  |
   21+45      1.5754      0.50  Q         |         |         |      V
   21+50      1.5788      0.49  Q         |         |         |      V
   21+55      1.5822      0.49  Q         |         |         |       V |
   22+ 0      1.5855      0.49  Q         |         |         |       V |
   22+ 5      1.5888      0.48  Q         |         |         |       V |
   22+10      1.5921      0.48  Q         |         |         |       V |
   22+15      1.5954      0.48  Q         |         |         |       V |
   22+20      1.5987      0.47  Q         |         |         |       V |
   22+25      1.6019      0.47  Q         |         |         |       V |
   22+30      1.6052      0.47  Q         |         |         |       V |
   22+35      1.6084      0.46  Q         |         |         |       V |
   22+40      1.6115      0.46  Q         |         |         |       V |
   22+45      1.6147      0.46  Q         |         |         |       V |
   22+50      1.6178      0.46  Q         |         |         |       V |
   22+55      1.6209      0.45  Q         |         |         |       V |
   23+ 0      1.6240      0.45  Q         |         |         |        V|
   23+ 5      1.6271      0.45  Q         |         |         |        V|
   23+10      1.6302      0.44  Q         |         |         |        V|
   23+15      1.6332      0.44  Q         |         |         |        V|
   23+20      1.6363      0.44  Q         |         |         |        V|
   23+25      1.6393      0.44  Q         |         |         |        V|
   23+30      1.6423      0.43  Q         |         |         |        V|
   23+35      1.6452      0.43  Q         |         |         |        V|
   23+40      1.6482      0.43  Q         |         |         |        V|
   23+45      1.6512      0.43  Q         |         |         |        V|
   23+50      1.6541      0.43  Q         |         |         |        V|
   23+55      1.6570      0.42  Q         |         |         |        V|
   24+ 0      1.6599      0.42  Q         |         |         |        V|
   24+ 5      1.6626      0.39  Q         |         |         |        V|
   24+10      1.6644      0.25  Q         |         |         |        V|
   24+15      1.6649      0.09  Q         |         |         |        V|
   24+20      1.6651      0.02  Q         |         |         |        V|
   24+25      1.6651      0.01  Q         |         |         |        V|
   24+30      1.6652      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

        Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018, Version 9.0

                Study date  03/23/21


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
------------------------------------------------------------------------

San Bernardino County Synthetic Unit Hydrology Method
                Manual date - August 1986


Program License Serial Number 6320

---------------------------------------------------------------------
204828 - TEC EQUIPMENT 776 MILL ST
DEVELOPED CONDITIONS
25-YEAR, 24-HOUR STORM
BY: JTS  DATE: 03-23-21
--------------------------------------------------------------------

        Storm Event Year = 25

        Antecedent Moisture Condition = 2

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format




Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 10
             7.01            1           0.83
--------------------------------------------------------------------
Rainfall data for year 2
             7.01            6           1.41
--------------------------------------------------------------------
Rainfall data for year 2
             7.01           24           2.40
--------------------------------------------------------------------
Rainfall data for year 100
             7.01            1           1.28
--------------------------------------------------------------------
Rainfall data for year 100
             7.01            6           2.60
--------------------------------------------------------------------
Rainfall data for year 100
             7.01           24           5.90
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 2)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 32.0      32.0          7.01      1.000     0.978    0.230    0.225

Area-averaged adjusted loss rate Fm (In/Hr) =  0.225

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN    SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)    (AMC2)           Yield Fr
```

```
     1.61   0.230         32.0      32.0      21.25     0.002
     5.40   0.770         98.0      98.0       0.20     0.949

Area-averaged catchment yield fraction, Y =  0.731
Area-averaged low loss fraction, Yb =  0.269
User entry of time of concentration  =   0.180 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       7.01(Ac.)
Catchment Lag time =   0.144 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 57.8704
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.225(In/Hr)
Average low loss rate fraction (Yb) = 0.269 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.373(In)
Computed peak 30-minute rainfall =  0.765(In)
Specified peak 1-hour rainfall =  1.009(In)
Computed peak 3-hour rainfall =  1.617(In)
Specified peak 6-hour rainfall =  2.178(In)
Specified peak 24-hour rainfall =  4.660(In)


Rainfall depth area reduction factors:
Using a total area of       7.01(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.373(In)
30-minute factor = 1.000    Adjusted rainfall =  0.764(In)
1-hour factor = 1.000       Adjusted rainfall =  1.009(In)
3-hour factor = 1.000       Adjusted rainfall =  1.617(In)
6-hour factor = 1.000       Adjusted rainfall =  2.178(In)
24-hour factor = 1.000      Adjusted rainfall =  4.660(In)
---------------------------------------------------------------------

                        U n i t  H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values             ((CFS))
---------------------------------------------------------------------
                (K =        84.78 (CFS))

  1                6.077                   5.152
  2               39.009                  27.919
  3               79.564                  34.381
  4               94.634                  12.776
  5               98.466                   3.248
  6               99.524                   0.897
  7              100.000                   0.404
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number              (In)                (In)
  1              0.3733               0.3733
  2              0.4926               0.1193
  3              0.5794               0.0867
  4              0.6500               0.0707
  5              0.7107               0.0607
  6              0.7645               0.0538
  7              0.8131               0.0486
  8              0.8577               0.0446
  9              0.8991               0.0414
 10              0.9378               0.0387
 11              0.9742               0.0364
 12              1.0087               0.0345
 13              1.0440               0.0353
 14              1.0778               0.0338
 15              1.1103               0.0324
 16              1.1415               0.0312
 17              1.1716               0.0301
 18              1.2007               0.0291
 19              1.2290               0.0282
 20              1.2564               0.0274
 21              1.2830               0.0266
 22              1.3089               0.0259
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23	1.3341	0.0252
24	1.3588	0.0246
25	1.3828	0.0240
26	1.4063	0.0235
27	1.4293	0.0230
28	1.4518	0.0225
29	1.4739	0.0221
30	1.4955	0.0216
31	1.5167	0.0212
32	1.5376	0.0208
33	1.5580	0.0205
34	1.5781	0.0201
35	1.5979	0.0198
36	1.6174	0.0195
37	1.6365	0.0191
38	1.6554	0.0189
39	1.6740	0.0186
40	1.6923	0.0183
41	1.7103	0.0180
42	1.7281	0.0178
43	1.7457	0.0176
44	1.7630	0.0173
45	1.7801	0.0171
46	1.7970	0.0169
47	1.8136	0.0167
48	1.8301	0.0165
49	1.8464	0.0163
50	1.8625	0.0161
51	1.8784	0.0159
52	1.8941	0.0157
53	1.9097	0.0156
54	1.9251	0.0154
55	1.9403	0.0152
56	1.9554	0.0151
57	1.9703	0.0149
58	1.9851	0.0148
59	1.9997	0.0146
60	2.0142	0.0145
61	2.0285	0.0144
62	2.0428	0.0142
63	2.0568	0.0141
64	2.0708	0.0140
65	2.0846	0.0138
66	2.0984	0.0137
67	2.1119	0.0136
68	2.1254	0.0135
69	2.1388	0.0134
70	2.1521	0.0133
71	2.1652	0.0132
72	2.1783	0.0130
73	2.1948	0.0165
74	2.2112	0.0164
75	2.2276	0.0163
76	2.2438	0.0162
77	2.2600	0.0161
78	2.2760	0.0161
79	2.2920	0.0160
80	2.3079	0.0159
81	2.3236	0.0158
82	2.3393	0.0157
83	2.3549	0.0156
84	2.3705	0.0155
85	2.3859	0.0154
86	2.4012	0.0154
87	2.4165	0.0153
88	2.4317	0.0152
89	2.4468	0.0151
90	2.4619	0.0150
91	2.4768	0.0150
92	2.4917	0.0149
93	2.5066	0.0148
94	2.5213	0.0147
95	2.5360	0.0147

96	2.5506	0.0146
97	2.5651	0.0145
98	2.5796	0.0145
99	2.5940	0.0144
100	2.6083	0.0143
101	2.6226	0.0143
102	2.6368	0.0142
103	2.6510	0.0141
104	2.6651	0.0141
105	2.6791	0.0140
106	2.6931	0.0140
107	2.7070	0.0139
108	2.7208	0.0138
109	2.7346	0.0138
110	2.7483	0.0137
111	2.7620	0.0137
112	2.7756	0.0136
113	2.7892	0.0136
114	2.8027	0.0135
115	2.8162	0.0135
116	2.8296	0.0134
117	2.8429	0.0134
118	2.8562	0.0133
119	2.8695	0.0133
120	2.8827	0.0132
121	2.8958	0.0132
122	2.9090	0.0131
123	2.9220	0.0131
124	2.9350	0.0130
125	2.9480	0.0130
126	2.9609	0.0129
127	2.9738	0.0129
128	2.9866	0.0128
129	2.9994	0.0128
130	3.0121	0.0127
131	3.0248	0.0127
132	3.0374	0.0126
133	3.0500	0.0126
134	3.0626	0.0126
135	3.0751	0.0125
136	3.0876	0.0125
137	3.1000	0.0124
138	3.1124	0.0124
139	3.1247	0.0124
140	3.1370	0.0123
141	3.1493	0.0123
142	3.1616	0.0122
143	3.1737	0.0122
144	3.1859	0.0122
145	3.1980	0.0121
146	3.2101	0.0121
147	3.2221	0.0120
148	3.2341	0.0120
149	3.2461	0.0120
150	3.2580	0.0119
151	3.2699	0.0119
152	3.2818	0.0119
153	3.2936	0.0118
154	3.3054	0.0118
155	3.3172	0.0118
156	3.3289	0.0117
157	3.3406	0.0117
158	3.3522	0.0117
159	3.3639	0.0116
160	3.3754	0.0116
161	3.3870	0.0116
162	3.3985	0.0115
163	3.4100	0.0115
164	3.4215	0.0115
165	3.4329	0.0114
166	3.4443	0.0114
167	3.4557	0.0114
168	3.4670	0.0113

169	3.4783	0.0113
170	3.4896	0.0113
171	3.5008	0.0112
172	3.5120	0.0112
173	3.5232	0.0112
174	3.5344	0.0112
175	3.5455	0.0111
176	3.5566	0.0111
177	3.5677	0.0111
178	3.5787	0.0110
179	3.5897	0.0110
180	3.6007	0.0110
181	3.6117	0.0110
182	3.6226	0.0109
183	3.6335	0.0109
184	3.6444	0.0109
185	3.6552	0.0109
186	3.6661	0.0108
187	3.6769	0.0108
188	3.6876	0.0108
189	3.6984	0.0107
190	3.7091	0.0107
191	3.7198	0.0107
192	3.7305	0.0107
193	3.7411	0.0106
194	3.7517	0.0106
195	3.7623	0.0106
196	3.7729	0.0106
197	3.7835	0.0105
198	3.7940	0.0105
199	3.8045	0.0105
200	3.8150	0.0105
201	3.8254	0.0105
202	3.8358	0.0104
203	3.8462	0.0104
204	3.8566	0.0104
205	3.8670	0.0104
206	3.8773	0.0103
207	3.8876	0.0103
208	3.8979	0.0103
209	3.9082	0.0103
210	3.9184	0.0102
211	3.9287	0.0102
212	3.9389	0.0102
213	3.9490	0.0102
214	3.9592	0.0102
215	3.9693	0.0101
216	3.9794	0.0101
217	3.9895	0.0101
218	3.9996	0.0101
219	4.0097	0.0101
220	4.0197	0.0100
221	4.0297	0.0100
222	4.0397	0.0100
223	4.0497	0.0100
224	4.0596	0.0100
225	4.0696	0.0099
226	4.0795	0.0099
227	4.0894	0.0099
228	4.0992	0.0099
229	4.1091	0.0099
230	4.1189	0.0098
231	4.1287	0.0098
232	4.1385	0.0098
233	4.1483	0.0098
234	4.1581	0.0098
235	4.1678	0.0097
236	4.1775	0.0097
237	4.1872	0.0097
238	4.1969	0.0097
239	4.2066	0.0097
240	4.2162	0.0096
241	4.2258	0.0096

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242              4.2354               0.0096
243              4.2450               0.0096
244              4.2546               0.0096
245              4.2642               0.0096
246              4.2737               0.0095
247              4.2832               0.0095
248              4.2927               0.0095
249              4.3022               0.0095
250              4.3117               0.0095
251              4.3211               0.0095
252              4.3306               0.0094
253              4.3400               0.0094
254              4.3494               0.0094
255              4.3588               0.0094
256              4.3681               0.0094
257              4.3775               0.0094
258              4.3868               0.0093
259              4.3961               0.0093
260              4.4054               0.0093
261              4.4147               0.0093
262              4.4240               0.0093
263              4.4333               0.0093
264              4.4425               0.0092
265              4.4517               0.0092
266              4.4609               0.0092
267              4.4701               0.0092
268              4.4793               0.0092
269              4.4885               0.0092
270              4.4976               0.0091
271              4.5067               0.0091
272              4.5158               0.0091
273              4.5249               0.0091
274              4.5340               0.0091
275              4.5431               0.0091
276              4.5522               0.0091
277              4.5612               0.0090
278              4.5702               0.0090
279              4.5792               0.0090
280              4.5882               0.0090
281              4.5972               0.0090
282              4.6062               0.0090
283              4.6151               0.0090
284              4.6241               0.0089
285              4.6330               0.0089
286              4.6419               0.0089
287              4.6508               0.0089
288              4.6597               0.0089
---------------------------------------------------------------------
Unit              Unit            Unit              Effective
Period            Rainfall        Soil-Loss         Rainfall
(number)            (In)          (In)                 (In)
---------------------------------------------------------------------
  1              0.0089           0.0024              0.0065
  2              0.0089           0.0024              0.0065
  3              0.0089           0.0024              0.0065
  4              0.0089           0.0024              0.0065
  5              0.0090           0.0024              0.0066
  6              0.0090           0.0024              0.0066
  7              0.0090           0.0024              0.0066
  8              0.0090           0.0024              0.0066
  9              0.0091           0.0024              0.0066
 10              0.0091           0.0024              0.0066
 11              0.0091           0.0024              0.0067
 12              0.0091           0.0024              0.0067
 13              0.0091           0.0025              0.0067
 14              0.0092           0.0025              0.0067
 15              0.0092           0.0025              0.0067
 16              0.0092           0.0025              0.0067
 17              0.0092           0.0025              0.0068
 18              0.0093           0.0025              0.0068
 19              0.0093           0.0025              0.0068
 20              0.0093           0.0025              0.0068
 21              0.0093           0.0025              0.0068
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22	0.0094	0.0025	0.0068
23	0.0094	0.0025	0.0069
24	0.0094	0.0025	0.0069
25	0.0094	0.0025	0.0069
26	0.0095	0.0025	0.0069
27	0.0095	0.0025	0.0069
28	0.0095	0.0026	0.0070
29	0.0095	0.0026	0.0070
30	0.0096	0.0026	0.0070
31	0.0096	0.0026	0.0070
32	0.0096	0.0026	0.0070
33	0.0096	0.0026	0.0071
34	0.0097	0.0026	0.0071
35	0.0097	0.0026	0.0071
36	0.0097	0.0026	0.0071
37	0.0098	0.0026	0.0071
38	0.0098	0.0026	0.0071
39	0.0098	0.0026	0.0072
40	0.0098	0.0026	0.0072
41	0.0099	0.0027	0.0072
42	0.0099	0.0027	0.0072
43	0.0099	0.0027	0.0073
44	0.0100	0.0027	0.0073
45	0.0100	0.0027	0.0073
46	0.0100	0.0027	0.0073
47	0.0101	0.0027	0.0074
48	0.0101	0.0027	0.0074
49	0.0101	0.0027	0.0074
50	0.0101	0.0027	0.0074
51	0.0102	0.0027	0.0074
52	0.0102	0.0027	0.0075
53	0.0102	0.0028	0.0075
54	0.0103	0.0028	0.0075
55	0.0103	0.0028	0.0075
56	0.0103	0.0028	0.0076
57	0.0104	0.0028	0.0076
58	0.0104	0.0028	0.0076
59	0.0105	0.0028	0.0076
60	0.0105	0.0028	0.0077
61	0.0105	0.0028	0.0077
62	0.0105	0.0028	0.0077
63	0.0106	0.0028	0.0077
64	0.0106	0.0029	0.0078
65	0.0107	0.0029	0.0078
66	0.0107	0.0029	0.0078
67	0.0107	0.0029	0.0079
68	0.0108	0.0029	0.0079
69	0.0108	0.0029	0.0079
70	0.0109	0.0029	0.0079
71	0.0109	0.0029	0.0080
72	0.0109	0.0029	0.0080
73	0.0110	0.0030	0.0080
74	0.0110	0.0030	0.0081
75	0.0111	0.0030	0.0081
76	0.0111	0.0030	0.0081
77	0.0112	0.0030	0.0082
78	0.0112	0.0030	0.0082
79	0.0112	0.0030	0.0082
80	0.0113	0.0030	0.0082
81	0.0113	0.0030	0.0083
82	0.0114	0.0031	0.0083
83	0.0114	0.0031	0.0084
84	0.0115	0.0031	0.0084
85	0.0115	0.0031	0.0084
86	0.0116	0.0031	0.0085
87	0.0116	0.0031	0.0085
88	0.0117	0.0031	0.0085
89	0.0117	0.0031	0.0086
90	0.0118	0.0032	0.0086
91	0.0118	0.0032	0.0086
92	0.0119	0.0032	0.0087
93	0.0119	0.0032	0.0087
94	0.0120	0.0032	0.0088

95	0.0120	0.0032	0.0088
96	0.0121	0.0032	0.0088
97	0.0122	0.0033	0.0089
98	0.0122	0.0033	0.0089
99	0.0123	0.0033	0.0090
100	0.0123	0.0033	0.0090
101	0.0124	0.0033	0.0091
102	0.0124	0.0033	0.0091
103	0.0125	0.0034	0.0092
104	0.0126	0.0034	0.0092
105	0.0126	0.0034	0.0092
106	0.0127	0.0034	0.0093
107	0.0128	0.0034	0.0093
108	0.0128	0.0034	0.0094
109	0.0129	0.0035	0.0094
110	0.0130	0.0035	0.0095
111	0.0131	0.0035	0.0095
112	0.0131	0.0035	0.0096
113	0.0132	0.0035	0.0097
114	0.0133	0.0036	0.0097
115	0.0134	0.0036	0.0098
116	0.0134	0.0036	0.0098
117	0.0135	0.0036	0.0099
118	0.0136	0.0036	0.0099
119	0.0137	0.0037	0.0100
120	0.0137	0.0037	0.0100
121	0.0138	0.0037	0.0101
122	0.0139	0.0037	0.0102
123	0.0140	0.0038	0.0103
124	0.0141	0.0038	0.0103
125	0.0142	0.0038	0.0104
126	0.0143	0.0038	0.0104
127	0.0144	0.0039	0.0105
128	0.0145	0.0039	0.0106
129	0.0146	0.0039	0.0107
130	0.0147	0.0039	0.0107
131	0.0148	0.0040	0.0108
132	0.0149	0.0040	0.0109
133	0.0150	0.0040	0.0110
134	0.0151	0.0041	0.0111
135	0.0153	0.0041	0.0112
136	0.0154	0.0041	0.0112
137	0.0155	0.0042	0.0114
138	0.0156	0.0042	0.0114
139	0.0158	0.0042	0.0115
140	0.0159	0.0043	0.0116
141	0.0161	0.0043	0.0117
142	0.0161	0.0043	0.0118
143	0.0163	0.0044	0.0120
144	0.0164	0.0044	0.0120
145	0.0130	0.0035	0.0095
146	0.0132	0.0035	0.0096
147	0.0134	0.0036	0.0098
148	0.0135	0.0036	0.0099
149	0.0137	0.0037	0.0100
150	0.0138	0.0037	0.0101
151	0.0141	0.0038	0.0103
152	0.0142	0.0038	0.0104
153	0.0145	0.0039	0.0106
154	0.0146	0.0039	0.0107
155	0.0149	0.0040	0.0109
156	0.0151	0.0040	0.0110
157	0.0154	0.0041	0.0113
158	0.0156	0.0042	0.0114
159	0.0159	0.0043	0.0116
160	0.0161	0.0043	0.0118
161	0.0165	0.0044	0.0120
162	0.0167	0.0045	0.0122
163	0.0171	0.0046	0.0125
164	0.0173	0.0047	0.0127
165	0.0178	0.0048	0.0130
166	0.0180	0.0048	0.0132
167	0.0186	0.0050	0.0136

168	0.0189	0.0051	0.0138
169	0.0195	0.0052	0.0142
170	0.0198	0.0053	0.0145
171	0.0205	0.0055	0.0150
172	0.0208	0.0056	0.0152
173	0.0216	0.0058	0.0158
174	0.0221	0.0059	0.0161
175	0.0230	0.0062	0.0168
176	0.0235	0.0063	0.0172
177	0.0246	0.0066	0.0180
178	0.0252	0.0068	0.0185
179	0.0266	0.0072	0.0195
180	0.0274	0.0074	0.0200
181	0.0291	0.0078	0.0213
182	0.0301	0.0081	0.0220
183	0.0324	0.0087	0.0237
184	0.0338	0.0091	0.0247
185	0.0345	0.0093	0.0252
186	0.0364	0.0098	0.0267
187	0.0414	0.0111	0.0303
188	0.0446	0.0120	0.0326
189	0.0538	0.0144	0.0393
190	0.0607	0.0163	0.0444
191	0.0867	0.0187	0.0680
192	0.1193	0.0187	0.1005
193	0.3733	0.0187	0.3546
194	0.0707	0.0187	0.0519
195	0.0486	0.0131	0.0356
196	0.0387	0.0104	0.0283
197	0.0353	0.0095	0.0258
198	0.0312	0.0084	0.0228
199	0.0282	0.0076	0.0206
200	0.0259	0.0070	0.0189
201	0.0240	0.0065	0.0176
202	0.0225	0.0060	0.0165
203	0.0212	0.0057	0.0155
204	0.0201	0.0054	0.0147
205	0.0191	0.0051	0.0140
206	0.0183	0.0049	0.0134
207	0.0176	0.0047	0.0128
208	0.0169	0.0045	0.0123
209	0.0163	0.0044	0.0119
210	0.0157	0.0042	0.0115
211	0.0152	0.0041	0.0111
212	0.0148	0.0040	0.0108
213	0.0144	0.0039	0.0105
214	0.0140	0.0038	0.0102
215	0.0136	0.0037	0.0099
216	0.0133	0.0036	0.0097
217	0.0165	0.0044	0.0121
218	0.0162	0.0044	0.0119
219	0.0160	0.0043	0.0117
220	0.0157	0.0042	0.0115
221	0.0154	0.0041	0.0113
222	0.0152	0.0041	0.0111
223	0.0150	0.0040	0.0109
224	0.0147	0.0040	0.0108
225	0.0145	0.0039	0.0106
226	0.0143	0.0039	0.0105
227	0.0141	0.0038	0.0103
228	0.0140	0.0038	0.0102
229	0.0138	0.0037	0.0101
230	0.0136	0.0037	0.0100
231	0.0135	0.0036	0.0098
232	0.0133	0.0036	0.0097
233	0.0132	0.0035	0.0096
234	0.0130	0.0035	0.0095
235	0.0129	0.0035	0.0094
236	0.0127	0.0034	0.0093
237	0.0126	0.0034	0.0092
238	0.0125	0.0034	0.0091
239	0.0124	0.0033	0.0090
240	0.0122	0.0033	0.0089

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      241              0.0121           0.0033              0.0089
      242              0.0120           0.0032              0.0088
      243              0.0119           0.0032              0.0087
      244              0.0118           0.0032              0.0086
      245              0.0117           0.0031              0.0085
      246              0.0116           0.0031              0.0085
      247              0.0115           0.0031              0.0084
      248              0.0114           0.0031              0.0083
      249              0.0113           0.0030              0.0083
      250              0.0112           0.0030              0.0082
      251              0.0111           0.0030              0.0081
      252              0.0110           0.0030              0.0081
      253              0.0110           0.0029              0.0080
      254              0.0109           0.0029              0.0080
      255              0.0108           0.0029              0.0079
      256              0.0107           0.0029              0.0078
      257              0.0106           0.0029              0.0078
      258              0.0106           0.0028              0.0077
      259              0.0105           0.0028              0.0077
      260              0.0104           0.0028              0.0076
      261              0.0104           0.0028              0.0076
      262              0.0103           0.0028              0.0075
      263              0.0102           0.0027              0.0075
      264              0.0102           0.0027              0.0074
      265              0.0101           0.0027              0.0074
      266              0.0100           0.0027              0.0073
      267              0.0100           0.0027              0.0073
      268              0.0099           0.0027              0.0072
      269              0.0099           0.0026              0.0072
      270              0.0098           0.0026              0.0072
      271              0.0097           0.0026              0.0071
      272              0.0097           0.0026              0.0071
      273              0.0096           0.0026              0.0070
      274              0.0096           0.0026              0.0070
      275              0.0095           0.0026              0.0070
      276              0.0095           0.0025              0.0069
      277              0.0094           0.0025              0.0069
      278              0.0094           0.0025              0.0069
      279              0.0093           0.0025              0.0068
      280              0.0093           0.0025              0.0068
      281              0.0092           0.0025              0.0067
      282              0.0092           0.0025              0.0067
      283              0.0091           0.0025              0.0067
      284              0.0091           0.0024              0.0066
      285              0.0090           0.0024              0.0066
      286              0.0090           0.0024              0.0066
      287              0.0090           0.0024              0.0065
      288              0.0089           0.0024              0.0065
      --------------------------------------------------------------------
      --------------------------------------------------------------------
      Total soil rain loss =      1.15(In)
      Total effective rainfall =      3.51(In)
      Peak flow rate in flood hydrograph =     15.39(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        5.0      10.0      15.0      20.0
-----------------------------------------------------------------------
  0+ 5       0.0002      0.03  Q         |         |         |         |
  0+10       0.0017      0.21  Q         |         |         |         |
  0+15       0.0047      0.44  Q         |         |         |         |
  0+20       0.0083      0.52  VQ        |         |         |         |
  0+25       0.0121      0.54  VQ        |         |         |         |
  0+30       0.0159      0.55  VQ        |         |         |         |
  0+35       0.0197      0.56  VQ        |         |         |         |
  0+40       0.0236      0.56  VQ        |         |         |         |
  0+45       0.0274      0.56  VQ        |         |         |         |
  0+50       0.0313      0.56  VQ        |         |         |         |
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0+55       0.0351      0.56  VQ        |         |         |         |
1+ 0       0.0390      0.56  VQ        |         |         |         |
1+ 5       0.0429      0.56  VQ        |         |         |         |
1+10       0.0468      0.57  VQ        |         |         |         |
1+15       0.0507      0.57  VQ        |         |         |         |
1+20       0.0546      0.57  |Q        |         |         |         |
1+25       0.0585      0.57  |Q        |         |         |         |
1+30       0.0625      0.57  |Q        |         |         |         |
1+35       0.0664      0.57  |Q        |         |         |         |
1+40       0.0704      0.57  |Q        |         |         |         |
1+45       0.0743      0.58  |Q        |         |         |         |
1+50       0.0783      0.58  |Q        |         |         |         |
1+55       0.0823      0.58  |Q        |         |         |         |
2+ 0       0.0863      0.58  |Q        |         |         |         |
2+ 5       0.0903      0.58  |Q        |         |         |         |
2+10       0.0943      0.58  |Q        |         |         |         |
2+15       0.0983      0.58  |Q        |         |         |         |
2+20       0.1024      0.59  |Q        |         |         |         |
2+25       0.1064      0.59  |QV       |         |         |         |
2+30       0.1105      0.59  |QV       |         |         |         |
2+35       0.1146      0.59  |QV       |         |         |         |
2+40       0.1186      0.59  |QV       |         |         |         |
2+45       0.1227      0.59  |QV       |         |         |         |
2+50       0.1268      0.60  |QV       |         |         |         |
2+55       0.1310      0.60  |QV       |         |         |         |
3+ 0       0.1351      0.60  |QV       |         |         |         |
3+ 5       0.1392      0.60  |QV       |         |         |         |
3+10       0.1434      0.60  |QV       |         |         |         |
3+15       0.1476      0.60  |QV       |         |         |         |
3+20       0.1517      0.61  |QV       |         |         |         |
3+25       0.1559      0.61  |Q V      |         |         |         |
3+30       0.1601      0.61  |Q V      |         |         |         |
3+35       0.1643      0.61  |Q V      |         |         |         |
3+40       0.1686      0.61  |Q V      |         |         |         |
3+45       0.1728      0.62  |Q V      |         |         |         |
3+50       0.1771      0.62  |Q V      |         |         |         |
3+55       0.1813      0.62  |Q V      |         |         |         |
4+ 0       0.1856      0.62  |Q V      |         |         |         |
4+ 5       0.1899      0.62  |Q V      |         |         |         |
4+10       0.1942      0.63  |Q V      |         |         |         |
4+15       0.1985      0.63  |Q V      |         |         |         |
4+20       0.2029      0.63  |Q V      |         |         |         |
4+25       0.2072      0.63  |Q  V     |         |         |         |
4+30       0.2116      0.63  |Q  V     |         |         |         |
4+35       0.2160      0.64  |Q  V     |         |         |         |
4+40       0.2203      0.64  |Q  V     |         |         |         |
4+45       0.2247      0.64  |Q  V     |         |         |         |
4+50       0.2292      0.64  |Q  V     |         |         |         |
4+55       0.2336      0.64  |Q  V     |         |         |         |
5+ 0       0.2380      0.65  |Q  V     |         |         |         |
5+ 5       0.2425      0.65  |Q  V     |         |         |         |
5+10       0.2470      0.65  |Q  V     |         |         |         |
5+15       0.2515      0.65  |Q  V     |         |         |         |
5+20       0.2560      0.65  |Q   V    |         |         |         |
5+25       0.2605      0.66  |Q   V    |         |         |         |
5+30       0.2651      0.66  |Q   V    |         |         |         |
5+35       0.2696      0.66  |Q   V    |         |         |         |
5+40       0.2742      0.66  |Q   V    |         |         |         |
5+45       0.2788      0.67  |Q   V    |         |         |         |
5+50       0.2834      0.67  |Q   V    |         |         |         |
5+55       0.2880      0.67  |Q   V    |         |         |         |
6+ 0       0.2926      0.67  |Q   V    |         |         |         |
6+ 5       0.2973      0.68  |Q   V    |         |         |         |
6+10       0.3020      0.68  |Q   V    |         |         |         |
6+15       0.3067      0.68  |Q   V    |         |         |         |
6+20       0.3114      0.68  |Q    V   |         |         |         |
6+25       0.3161      0.69  |Q    V   |         |         |         |
6+30       0.3208      0.69  |Q    V   |         |         |         |
6+35       0.3256      0.69  |Q    V   |         |         |         |
6+40       0.3304      0.69  |Q    V   |         |         |         |
6+45       0.3352      0.70  |Q    V   |         |         |         |
6+50       0.3400      0.70  |Q    V   |         |         |         |
6+55       0.3449      0.70  |Q    V   |         |         |         |
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 7+ 0       0.3497      0.71  |Q    V   |         |         |         |
 7+ 5       0.3546      0.71  |Q    V   |         |         |         |
 7+10       0.3595      0.71  |Q     V  |         |         |         |
 7+15       0.3644      0.71  |Q     V  |         |         |         |
 7+20       0.3694      0.72  |Q     V  |         |         |         |
 7+25       0.3743      0.72  |Q     V  |         |         |         |
 7+30       0.3793      0.72  |Q     V  |         |         |         |
 7+35       0.3843      0.73  |Q     V  |         |         |         |
 7+40       0.3893      0.73  |Q     V  |         |         |         |
 7+45       0.3944      0.73  |Q     V  |         |         |         |
 7+50       0.3995      0.74  |Q     V  |         |         |         |
 7+55       0.4046      0.74  |Q     V  |         |         |         |
 8+ 0       0.4097      0.74  |Q      V |         |         |         |
 8+ 5       0.4148      0.75  |Q      V |         |         |         |
 8+10       0.4200      0.75  |Q      V |         |         |         |
 8+15       0.4252      0.75  |Q      V |         |         |         |
 8+20       0.4304      0.76  |Q      V |         |         |         |
 8+25       0.4356      0.76  |Q      V |         |         |         |
 8+30       0.4409      0.76  |Q      V |         |         |         |
 8+35       0.4462      0.77  |Q      V |         |         |         |
 8+40       0.4515      0.77  |Q      V |         |         |         |
 8+45       0.4568      0.78  |Q      V |         |         |         |
 8+50       0.4622      0.78  |Q       V|         |         |         |
 8+55       0.4676      0.78  |Q       V|         |         |         |
 9+ 0       0.4730      0.79  |Q       V|         |         |         |
 9+ 5       0.4785      0.79  |Q       V|         |         |         |
 9+10       0.4840      0.80  |Q       V|         |         |         |
 9+15       0.4895      0.80  |Q       V|         |         |         |
 9+20       0.4950      0.81  |Q       V|         |         |         |
 9+25       0.5006      0.81  |Q       V|         |         |         |
 9+30       0.5062      0.81  |Q       V|         |         |         |
 9+35       0.5119      0.82  |Q       V|         |         |         |
 9+40       0.5175      0.82  |Q        V         |         |         |
 9+45       0.5232      0.83  |Q        V         |         |         |
 9+50       0.5290      0.83  |Q        V         |         |         |
 9+55       0.5347      0.84  |Q        V         |         |         |
10+ 0       0.5405      0.84  |Q        V         |         |         |
10+ 5       0.5464      0.85  |Q        V         |         |         |
10+10       0.5523      0.85  |Q        V         |         |         |
10+15       0.5582      0.86  |Q        V         |         |         |
10+20       0.5641      0.86  |Q        |V        |         |         |
10+25       0.5701      0.87  |Q        |V        |         |         |
10+30       0.5762      0.88  |Q        |V        |         |         |
10+35       0.5822      0.88  |Q        |V        |         |         |
10+40       0.5883      0.89  |Q        |V        |         |         |
10+45       0.5945      0.89  |Q        |V        |         |         |
10+50       0.6007      0.90  |Q        |V        |         |         |
10+55       0.6069      0.91  |Q        |V        |         |         |
11+ 0       0.6132      0.91  |Q        |V        |         |         |
11+ 5       0.6195      0.92  |Q        | V       |         |         |
11+10       0.6259      0.93  |Q        | V       |         |         |
11+15       0.6323      0.93  |Q        | V       |         |         |
11+20       0.6388      0.94  |Q        | V       |         |         |
11+25       0.6453      0.95  |Q        | V       |         |         |
11+30       0.6519      0.95  |Q        | V       |         |         |
11+35       0.6585      0.96  |Q        | V       |         |         |
11+40       0.6652      0.97  |Q        | V       |         |         |
11+45       0.6720      0.98  |Q        |  V      |         |         |
11+50       0.6787      0.99  |Q        |  V      |         |         |
11+55       0.6856      1.00  |Q        |  V      |         |         |
12+ 0       0.6925      1.00  | Q       |  V      |         |         |
12+ 5       0.6994      1.00  |Q        |  V      |         |         |
12+10       0.7059      0.94  |Q        |  V      |         |         |
12+15       0.7117      0.85  |Q        |  V      |         |         |
12+20       0.7175      0.83  |Q        |   V     |         |         |
12+25       0.7232      0.83  |Q        |   V     |         |         |
12+30       0.7290      0.84  |Q        |   V     |         |         |
12+35       0.7348      0.85  |Q        |   V     |         |         |
12+40       0.7408      0.86  |Q        |   V     |         |         |
12+45       0.7468      0.87  |Q        |   V     |         |         |
12+50       0.7529      0.89  |Q        |   V     |         |         |
12+55       0.7591      0.90  |Q        |   V     |         |         |
13+ 0       0.7654      0.91  |Q        |   V     |         |         |
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13+ 5       0.7717      0.93  |Q        |    V    |         |         |
13+10       0.7782      0.94  |Q        |    V    |         |         |
13+15       0.7848      0.95  |Q        |    V    |         |         |
13+20       0.7915      0.97  |Q        |    V    |         |         |
13+25       0.7983      0.99  |Q        |    V    |         |         |
13+30       0.8052      1.00  | Q       |    V    |         |         |
13+35       0.8122      1.02  | Q       |    V    |         |         |
13+40       0.8194      1.04  | Q       |     V   |         |         |
13+45       0.8267      1.06  | Q       |     V   |         |         |
13+50       0.8341      1.08  | Q       |     V   |         |         |
13+55       0.8417      1.10  | Q       |     V   |         |         |
14+ 0       0.8495      1.13  | Q       |     V   |         |         |
14+ 5       0.8575      1.15  | Q       |     V   |         |         |
14+10       0.8656      1.18  | Q       |     V   |         |         |
14+15       0.8739      1.21  | Q       |      V  |         |         |
14+20       0.8824      1.24  | Q       |      V  |         |         |
14+25       0.8912      1.27  | Q       |      V  |         |         |
14+30       0.9002      1.31  | Q       |      V  |         |         |
14+35       0.9094      1.34  | Q       |      V  |         |         |
14+40       0.9189      1.38  | Q       |      V  |         |         |
14+45       0.9288      1.43  | Q       |       V |         |         |
14+50       0.9389      1.48  | Q       |       V |         |         |
14+55       0.9495      1.53  |  Q      |       V |         |         |
15+ 0       0.9604      1.59  |  Q      |       V |         |         |
15+ 5       0.9718      1.65  |  Q      |       V |         |         |
15+10       0.9837      1.73  |  Q      |        V|         |         |
15+15       0.9962      1.81  |  Q      |        V|         |         |
15+20       1.0094      1.91  |  Q      |        V|         |         |
15+25       1.0232      2.01  |   Q     |        V|         |         |
15+30       1.0376      2.09  |   Q     |         V         |         |
15+35       1.0527      2.19  |   Q     |         V         |         |
15+40       1.0690      2.36  |   Q     |         V         |         |
15+45       1.0869      2.61  |    Q    |         |V        |         |
15+50       1.1073      2.95  |    Q    |         |V        |         |
15+55       1.1313      3.49  |     Q   |         | V       |         |
16+ 0       1.1629      4.59  |        Q|         | V       |         |
16+ 5       1.2160      7.71  |         |    Q    |  V      |         |
16+10       1.3171     14.69  |         |         |    V   Q|         |
16+15       1.4231     15.39  |         |         |      V  Q         |
16+20       1.4772      7.86  |         |    Q    |       V |         |
16+25       1.5053      4.08  |       Q |         |        V|         |
16+30       1.5246      2.79  |    Q    |         |        V|         |
16+35       1.5404      2.30  |   Q     |         |         V         |
16+40       1.5537      1.93  |  Q      |         |         V         |
16+45       1.5657      1.74  |  Q      |         |         V         |
16+50       1.5767      1.60  |  Q      |         |         V         |
16+55       1.5870      1.48  | Q       |         |         V         |
17+ 0       1.5965      1.39  | Q       |         |         |V        |
17+ 5       1.6055      1.31  | Q       |         |         |V        |
17+10       1.6141      1.24  | Q       |         |         |V        |
17+15       1.6222      1.18  | Q       |         |         |V        |
17+20       1.6300      1.13  | Q       |         |         |V        |
17+25       1.6375      1.08  | Q       |         |         |V        |
17+30       1.6447      1.04  | Q       |         |         | V       |
17+35       1.6516      1.01  | Q       |         |         | V       |
17+40       1.6583      0.97  |Q        |         |         | V       |
17+45       1.6647      0.94  |Q        |         |         | V       |
17+50       1.6710      0.91  |Q        |         |         | V       |
17+55       1.6771      0.89  |Q        |         |         | V       |
18+ 0       1.6831      0.86  |Q        |         |         | V       |
18+ 5       1.6889      0.85  |Q        |         |         | V       |
18+10       1.6952      0.91  |Q        |         |         |  V      |
18+15       1.7019      0.98  |Q        |         |         |  V      |
18+20       1.7088      0.99  |Q        |         |         |  V      |
18+25       1.7155      0.98  |Q        |         |         |  V      |
18+30       1.7222      0.97  |Q        |         |         |  V      |
18+35       1.7288      0.95  |Q        |         |         |  V      |
18+40       1.7353      0.94  |Q        |         |         |  V      |
18+45       1.7416      0.93  |Q        |         |         |   V     |
18+50       1.7479      0.91  |Q        |         |         |   V     |
18+55       1.7541      0.90  |Q        |         |         |   V     |
19+ 0       1.7602      0.89  |Q        |         |         |   V     |
19+ 5       1.7663      0.88  |Q        |         |         |   V     |
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   19+10       1.7722      0.86  |Q        |         |         |   V     |
   19+15       1.7781      0.85  |Q        |         |         |   V     |
   19+20       1.7839      0.84  |Q        |         |         |   V     |
   19+25       1.7896      0.83  |Q        |         |         |   V     |
   19+30       1.7953      0.82  |Q        |         |         |    V    |
   19+35       1.8009      0.81  |Q        |         |         |    V    |
   19+40       1.8064      0.81  |Q        |         |         |    V    |
   19+45       1.8119      0.80  |Q        |         |         |    V    |
   19+50       1.8174      0.79  |Q        |         |         |    V    |
   19+55       1.8227      0.78  |Q        |         |         |    V    |
   20+ 0       1.8281      0.77  |Q        |         |         |    V    |
   20+ 5       1.8333      0.76  |Q        |         |         |    V    |
   20+10       1.8385      0.76  |Q        |         |         |    V    |
   20+15       1.8437      0.75  |Q        |         |         |     V   |
   20+20       1.8488      0.74  |Q        |         |         |     V   |
   20+25       1.8539      0.74  |Q        |         |         |     V   |
   20+30       1.8589      0.73  |Q        |         |         |     V   |
   20+35       1.8639      0.72  |Q        |         |         |     V   |
   20+40       1.8688      0.72  |Q        |         |         |     V   |
   20+45       1.8737      0.71  |Q        |         |         |     V   |
   20+50       1.8786      0.71  |Q        |         |         |     V   |
   20+55       1.8834      0.70  |Q        |         |         |     V   |
   21+ 0       1.8882      0.69  |Q        |         |         |     V   |
   21+ 5       1.8930      0.69  |Q        |         |         |     V   |
   21+10       1.8977      0.68  |Q        |         |         |      V  |
   21+15       1.9023      0.68  |Q        |         |         |      V  |
   21+20       1.9070      0.67  |Q        |         |         |      V  |
   21+25       1.9116      0.67  |Q        |         |         |      V  |
   21+30       1.9162      0.66  |Q        |         |         |      V  |
   21+35       1.9207      0.66  |Q        |         |         |      V  |
   21+40       1.9252      0.65  |Q        |         |         |      V  |
   21+45       1.9297      0.65  |Q        |         |         |      V  |
   21+50       1.9341      0.65  |Q        |         |         |      V  |
   21+55       1.9385      0.64  |Q        |         |         |      V  |
   22+ 0       1.9429      0.64  |Q        |         |         |      V  |
   22+ 5       1.9473      0.63  |Q        |         |         |       V |
   22+10       1.9516      0.63  |Q        |         |         |       V |
   22+15       1.9559      0.63  |Q        |         |         |       V |
   22+20       1.9602      0.62  |Q        |         |         |       V |
   22+25       1.9645      0.62  |Q        |         |         |       V |
   22+30       1.9687      0.61  |Q        |         |         |       V |
   22+35       1.9729      0.61  |Q        |         |         |       V |
   22+40       1.9771      0.61  |Q        |         |         |       V |
   22+45       1.9812      0.60  |Q        |         |         |       V |
   22+50       1.9854      0.60  |Q        |         |         |       V |
   22+55       1.9895      0.60  |Q        |         |         |       V |
   23+ 0       1.9936      0.59  |Q        |         |         |       V |
   23+ 5       1.9976      0.59  |Q        |         |         |        V|
   23+10       2.0017      0.59  |Q        |         |         |        V|
   23+15       2.0057      0.58  |Q        |         |         |        V|
   23+20       2.0097      0.58  |Q        |         |         |        V|
   23+25       2.0136      0.58  |Q        |         |         |        V|
   23+30       2.0176      0.57  |Q        |         |         |        V|
   23+35       2.0215      0.57  |Q        |         |         |        V|
   23+40       2.0255      0.57  |Q        |         |         |        V|
   23+45       2.0293      0.57  |Q        |         |         |        V|
   23+50       2.0332      0.56  |Q        |         |         |        V|
   23+55       2.0371      0.56  |Q        |         |         |        V|
   24+ 0       2.0409      0.56  |Q        |         |         |        V|
   24+ 5       2.0445      0.52  |Q        |         |         |        V|
   24+10       2.0468      0.34  Q         |         |         |        V|
   24+15       2.0476      0.11  Q         |         |         |        V|
   24+20       2.0478      0.03  Q         |         |         |        V|
   24+25       2.0479      0.01  Q         |         |         |        V|
   24+30       2.0479      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  03/23/21


+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
-------------------------------------------------------------------------

San Bernardino County Synthetic Unit Hydrology Method
                Manual date - August 1986


Program License Serial Number 6320

----------------------------------------------------------------------
204828 - TEC EQUIPMENT 776 MILL ST
DEVELOPED CONDITIONS
100-YEAR, 24-HOUR STORM
BY: JTS  DATE: 03-23-21
---------------------------------------------------------------------

        Storm Event Year = 100

        Antecedent Moisture Condition = 3

 English (in-lb) Input Units Used

 English Rainfall Data (Inches) Input Values Used

 English Units used in output format




Area averaged rainfall intensity isohyetal data:
        Sub-Area        Duration        Isohyetal
        (Ac.)            (hours)         (In)
Rainfall data for year 10
             7.01           1           0.83
---------------------------------------------------------------------
Rainfall data for year 2
             7.01           6           1.41
---------------------------------------------------------------------
Rainfall data for year 2
             7.01          24           2.40
---------------------------------------------------------------------
Rainfall data for year 100
             7.01           1           1.28
---------------------------------------------------------------------
Rainfall data for year 100
             7.01           6           2.60
---------------------------------------------------------------------
Rainfall data for year 100
             7.01          24           5.90
---------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********


SCS curve  SCS curve     Area     Area     Fp(Fig C6)    Ap      Fm
No.(AMCII) NO.(AMC 3)    (Ac.)    Fraction     (In/Hr)  (dec.)   (In/Hr)
 32.0      52.0          7.01      1.000     0.785    0.230    0.181

Area-averaged adjusted loss rate Fm (In/Hr) =  0.181

********* Area-Averaged low loss rate fraction, Yb **********

Area       Area          SCS CN     SCS CN      S     Pervious
 (Ac.)      Fract         (AMC2)     (AMC3)           Yield Fr
```

```
     1.61   0.230         32.0      52.0       9.23     0.210
     5.40   0.770         98.0      98.0       0.20     0.960

Area-averaged catchment yield fraction, Y =  0.787
Area-averaged low loss fraction, Yb =  0.213
User entry of time of concentration  =   0.180 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area =       7.01(Ac.)
Catchment Lag time =   0.144 hours
Unit interval =   5.000 minutes
Unit interval percentage of lag time = 57.8704
Hydrograph baseflow =     0.00(CFS)
Average maximum watershed loss rate(Fm) =  0.181(In/Hr)
Average low loss rate fraction (Yb) = 0.213 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall =  0.474(In)
Computed peak 30-minute rainfall =  0.970(In)
Specified peak 1-hour rainfall =  1.280(In)
Computed peak 3-hour rainfall =  1.977(In)
Specified peak 6-hour rainfall =  2.600(In)
Specified peak 24-hour rainfall =  5.900(In)


Rainfall depth area reduction factors:
Using a total area of       7.01(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000     Adjusted rainfall =  0.474(In)
30-minute factor = 1.000    Adjusted rainfall =  0.970(In)
1-hour factor = 1.000       Adjusted rainfall =  1.280(In)
3-hour factor = 1.000       Adjusted rainfall =  1.976(In)
6-hour factor = 1.000       Adjusted rainfall =  2.600(In)
24-hour factor = 1.000      Adjusted rainfall =  5.900(In)
---------------------------------------------------------------------

                        U n i t   H y d r o g r a p h
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval          'S' Graph          Unit Hydrograph
Number            Mean values            ((CFS))
---------------------------------------------------------------------
                (K =        84.78 (CFS))

  1                6.077                   5.152
  2               39.009                  27.919
  3               79.564                  34.381
  4               94.634                  12.776
  5               98.466                   3.248
  6               99.524                   0.897
  7              100.000                   0.404
---------------------------------------------------------------------
Peak Unit   Adjusted mass rainfall  Unit rainfall
Number              (In)                (In)
  1              0.4736               0.4736
  2              0.6249               0.1513
  3              0.7349               0.1100
  4              0.8246               0.0896
  5              0.9015               0.0770
  6              0.9697               0.0682
  7              1.0314               0.0617
  8              1.0880               0.0566
  9              1.1405               0.0525
 10              1.1896               0.0491
 11              1.2358               0.0462
 12              1.2796               0.0438
 13              1.3208               0.0412
 14              1.3601               0.0393
 15              1.3977               0.0376
 16              1.4339               0.0362
 17              1.4687               0.0348
 18              1.5023               0.0336
 19              1.5348               0.0325
 20              1.5663               0.0315
 21              1.5968               0.0305
 22              1.6265               0.0297
```

23	1.6554	0.0289
24	1.6835	0.0281
25	1.7109	0.0274
26	1.7377	0.0268
27	1.7638	0.0261
28	1.7894	0.0256
29	1.8144	0.0250
30	1.8389	0.0245
31	1.8629	0.0240
32	1.8865	0.0236
33	1.9096	0.0231
34	1.9323	0.0227
35	1.9546	0.0223
36	1.9765	0.0219
37	1.9980	0.0215
38	2.0192	0.0212
39	2.0401	0.0209
40	2.0606	0.0205
41	2.0808	0.0202
42	2.1008	0.0199
43	2.1204	0.0196
44	2.1398	0.0194
45	2.1589	0.0191
46	2.1777	0.0188
47	2.1963	0.0186
48	2.2147	0.0184
49	2.2328	0.0181
50	2.2507	0.0179
51	2.2684	0.0177
52	2.2859	0.0175
53	2.3032	0.0173
54	2.3203	0.0171
55	2.3372	0.0169
56	2.3539	0.0167
57	2.3705	0.0165
58	2.3868	0.0164
59	2.4030	0.0162
60	2.4191	0.0160
61	2.4349	0.0159
62	2.4506	0.0157
63	2.4662	0.0156
64	2.4816	0.0154
65	2.4969	0.0153
66	2.5120	0.0151
67	2.5270	0.0150
68	2.5418	0.0149
69	2.5565	0.0147
70	2.5711	0.0146
71	2.5856	0.0145
72	2.5999	0.0143
73	2.6212	0.0213
74	2.6424	0.0212
75	2.6634	0.0210
76	2.6844	0.0209
77	2.7052	0.0208
78	2.7259	0.0207
79	2.7465	0.0206
80	2.7670	0.0205
81	2.7874	0.0204
82	2.8077	0.0203
83	2.8279	0.0202
84	2.8480	0.0201
85	2.8680	0.0200
86	2.8879	0.0199
87	2.9077	0.0198
88	2.9274	0.0197
89	2.9470	0.0196
90	2.9665	0.0195
91	2.9860	0.0194
92	3.0053	0.0194
93	3.0246	0.0193
94	3.0438	0.0192
95	3.0629	0.0191

96	3.0819	0.0190
97	3.1008	0.0189
98	3.1197	0.0189
99	3.1385	0.0188
100	3.1572	0.0187
101	3.1758	0.0186
102	3.1943	0.0185
103	3.2128	0.0185
104	3.2312	0.0184
105	3.2495	0.0183
106	3.2678	0.0183
107	3.2860	0.0182
108	3.3041	0.0181
109	3.3222	0.0181
110	3.3401	0.0180
111	3.3580	0.0179
112	3.3759	0.0178
113	3.3937	0.0178
114	3.4114	0.0177
115	3.4291	0.0177
116	3.4467	0.0176
117	3.4642	0.0175
118	3.4817	0.0175
119	3.4991	0.0174
120	3.5164	0.0174
121	3.5337	0.0173
122	3.5509	0.0172
123	3.5681	0.0172
124	3.5852	0.0171
125	3.6023	0.0171
126	3.6193	0.0170
127	3.6363	0.0170
128	3.6532	0.0169
129	3.6700	0.0168
130	3.6868	0.0168
131	3.7035	0.0167
132	3.7202	0.0167
133	3.7369	0.0166
134	3.7534	0.0166
135	3.7700	0.0165
136	3.7865	0.0165
137	3.8029	0.0164
138	3.8193	0.0164
139	3.8356	0.0163
140	3.8519	0.0163
141	3.8681	0.0162
142	3.8843	0.0162
143	3.9005	0.0161
144	3.9166	0.0161
145	3.9326	0.0161
146	3.9486	0.0160
147	3.9646	0.0160
148	3.9805	0.0159
149	3.9964	0.0159
150	4.0122	0.0158
151	4.0280	0.0158
152	4.0438	0.0157
153	4.0595	0.0157
154	4.0751	0.0157
155	4.0908	0.0156
156	4.1063	0.0156
157	4.1219	0.0155
158	4.1374	0.0155
159	4.1528	0.0155
160	4.1683	0.0154
161	4.1836	0.0154
162	4.1990	0.0153
163	4.2143	0.0153
164	4.2295	0.0153
165	4.2448	0.0152
166	4.2600	0.0152
167	4.2751	0.0152
168	4.2902	0.0151

169	4.3053	0.0151
170	4.3203	0.0150
171	4.3353	0.0150
172	4.3503	0.0150
173	4.3652	0.0149
174	4.3801	0.0149
175	4.3950	0.0149
176	4.4098	0.0148
177	4.4246	0.0148
178	4.4394	0.0148
179	4.4541	0.0147
180	4.4688	0.0147
181	4.4835	0.0147
182	4.4981	0.0146
183	4.5127	0.0146
184	4.5272	0.0146
185	4.5418	0.0145
186	4.5563	0.0145
187	4.5707	0.0145
188	4.5852	0.0144
189	4.5996	0.0144
190	4.6139	0.0144
191	4.6283	0.0143
192	4.6426	0.0143
193	4.6569	0.0143
194	4.6711	0.0142
195	4.6853	0.0142
196	4.6995	0.0142
197	4.7137	0.0142
198	4.7278	0.0141
199	4.7419	0.0141
200	4.7560	0.0141
201	4.7700	0.0140
202	4.7840	0.0140
203	4.7980	0.0140
204	4.8120	0.0140
205	4.8259	0.0139
206	4.8398	0.0139
207	4.8537	0.0139
208	4.8675	0.0138
209	4.8813	0.0138
210	4.8951	0.0138
211	4.9089	0.0138
212	4.9226	0.0137
213	4.9363	0.0137
214	4.9500	0.0137
215	4.9637	0.0137
216	4.9773	0.0136
217	4.9909	0.0136
218	5.0045	0.0136
219	5.0181	0.0136
220	5.0316	0.0135
221	5.0451	0.0135
222	5.0586	0.0135
223	5.0720	0.0135
224	5.0855	0.0134
225	5.0989	0.0134
226	5.1123	0.0134
227	5.1256	0.0134
228	5.1390	0.0133
229	5.1523	0.0133
230	5.1656	0.0133
231	5.1788	0.0133
232	5.1921	0.0132
233	5.2053	0.0132
234	5.2185	0.0132
235	5.2316	0.0132
236	5.2448	0.0131
237	5.2579	0.0131
238	5.2710	0.0131
239	5.2841	0.0131
240	5.2972	0.0131
241	5.3102	0.0130

```
242              5.3232               0.0130
243              5.3362               0.0130
244              5.3492               0.0130
245              5.3621               0.0129
246              5.3750               0.0129
247              5.3880               0.0129
248              5.4008               0.0129
249              5.4137               0.0129
250              5.4265               0.0128
251              5.4394               0.0128
252              5.4522               0.0128
253              5.4649               0.0128
254              5.4777               0.0128
255              5.4904               0.0127
256              5.5032               0.0127
257              5.5158               0.0127
258              5.5285               0.0127
259              5.5412               0.0127
260              5.5538               0.0126
261              5.5664               0.0126
262              5.5790               0.0126
263              5.5916               0.0126
264              5.6042               0.0126
265              5.6167               0.0125
266              5.6292               0.0125
267              5.6417               0.0125
268              5.6542               0.0125
269              5.6667               0.0125
270              5.6791               0.0124
271              5.6915               0.0124
272              5.7039               0.0124
273              5.7163               0.0124
274              5.7287               0.0124
275              5.7410               0.0123
276              5.7534               0.0123
277              5.7657               0.0123
278              5.7780               0.0123
279              5.7903               0.0123
280              5.8025               0.0123
281              5.8148               0.0122
282              5.8270               0.0122
283              5.8392               0.0122
284              5.8514               0.0122
285              5.8635               0.0122
286              5.8757               0.0122
287              5.8878               0.0121
288              5.8999               0.0121
---------------------------------------------------------------------
Unit              Unit            Unit              Effective
Period            Rainfall        Soil-Loss         Rainfall
(number)            (In)          (In)                 (In)
---------------------------------------------------------------------
  1              0.0121           0.0026              0.0095
  2              0.0121           0.0026              0.0096
  3              0.0122           0.0026              0.0096
  4              0.0122           0.0026              0.0096
  5              0.0122           0.0026              0.0096
  6              0.0122           0.0026              0.0096
  7              0.0123           0.0026              0.0097
  8              0.0123           0.0026              0.0097
  9              0.0123           0.0026              0.0097
 10              0.0123           0.0026              0.0097
 11              0.0124           0.0026              0.0098
 12              0.0124           0.0026              0.0098
 13              0.0124           0.0026              0.0098
 14              0.0125           0.0027              0.0098
 15              0.0125           0.0027              0.0098
 16              0.0125           0.0027              0.0099
 17              0.0126           0.0027              0.0099
 18              0.0126           0.0027              0.0099
 19              0.0126           0.0027              0.0099
 20              0.0126           0.0027              0.0099
 21              0.0127           0.0027              0.0100
```

22	0.0127	0.0027	0.0100
23	0.0127	0.0027	0.0100
24	0.0128	0.0027	0.0100
25	0.0128	0.0027	0.0101
26	0.0128	0.0027	0.0101
27	0.0129	0.0027	0.0101
28	0.0129	0.0027	0.0101
29	0.0129	0.0028	0.0102
30	0.0129	0.0028	0.0102
31	0.0130	0.0028	0.0102
32	0.0130	0.0028	0.0102
33	0.0131	0.0028	0.0103
34	0.0131	0.0028	0.0103
35	0.0131	0.0028	0.0103
36	0.0131	0.0028	0.0103
37	0.0132	0.0028	0.0104
38	0.0132	0.0028	0.0104
39	0.0133	0.0028	0.0104
40	0.0133	0.0028	0.0105
41	0.0133	0.0028	0.0105
42	0.0134	0.0028	0.0105
43	0.0134	0.0029	0.0106
44	0.0134	0.0029	0.0106
45	0.0135	0.0029	0.0106
46	0.0135	0.0029	0.0106
47	0.0136	0.0029	0.0107
48	0.0136	0.0029	0.0107
49	0.0136	0.0029	0.0107
50	0.0137	0.0029	0.0108
51	0.0137	0.0029	0.0108
52	0.0137	0.0029	0.0108
53	0.0138	0.0029	0.0109
54	0.0138	0.0029	0.0109
55	0.0139	0.0030	0.0109
56	0.0139	0.0030	0.0109
57	0.0140	0.0030	0.0110
58	0.0140	0.0030	0.0110
59	0.0140	0.0030	0.0111
60	0.0141	0.0030	0.0111
61	0.0141	0.0030	0.0111
62	0.0142	0.0030	0.0111
63	0.0142	0.0030	0.0112
64	0.0142	0.0030	0.0112
65	0.0143	0.0030	0.0113
66	0.0143	0.0031	0.0113
67	0.0144	0.0031	0.0113
68	0.0144	0.0031	0.0114
69	0.0145	0.0031	0.0114
70	0.0145	0.0031	0.0114
71	0.0146	0.0031	0.0115
72	0.0146	0.0031	0.0115
73	0.0147	0.0031	0.0116
74	0.0147	0.0031	0.0116
75	0.0148	0.0031	0.0116
76	0.0148	0.0032	0.0117
77	0.0149	0.0032	0.0117
78	0.0149	0.0032	0.0118
79	0.0150	0.0032	0.0118
80	0.0150	0.0032	0.0118
81	0.0151	0.0032	0.0119
82	0.0152	0.0032	0.0119
83	0.0152	0.0032	0.0120
84	0.0153	0.0032	0.0120
85	0.0153	0.0033	0.0121
86	0.0154	0.0033	0.0121
87	0.0155	0.0033	0.0122
88	0.0155	0.0033	0.0122
89	0.0156	0.0033	0.0123
90	0.0156	0.0033	0.0123
91	0.0157	0.0033	0.0124
92	0.0157	0.0034	0.0124
93	0.0158	0.0034	0.0125
94	0.0159	0.0034	0.0125

95	0.0160	0.0034	0.0126
96	0.0160	0.0034	0.0126
97	0.0161	0.0034	0.0127
98	0.0161	0.0034	0.0127
99	0.0162	0.0035	0.0128
100	0.0163	0.0035	0.0128
101	0.0164	0.0035	0.0129
102	0.0164	0.0035	0.0129
103	0.0165	0.0035	0.0130
104	0.0166	0.0035	0.0131
105	0.0167	0.0036	0.0131
106	0.0167	0.0036	0.0132
107	0.0168	0.0036	0.0133
108	0.0169	0.0036	0.0133
109	0.0170	0.0036	0.0134
110	0.0171	0.0036	0.0134
111	0.0172	0.0037	0.0135
112	0.0172	0.0037	0.0136
113	0.0174	0.0037	0.0137
114	0.0174	0.0037	0.0137
115	0.0175	0.0037	0.0138
116	0.0176	0.0037	0.0138
117	0.0177	0.0038	0.0139
118	0.0178	0.0038	0.0140
119	0.0179	0.0038	0.0141
120	0.0180	0.0038	0.0142
121	0.0181	0.0039	0.0143
122	0.0182	0.0039	0.0143
123	0.0183	0.0039	0.0144
124	0.0184	0.0039	0.0145
125	0.0185	0.0039	0.0146
126	0.0186	0.0040	0.0147
127	0.0188	0.0040	0.0148
128	0.0189	0.0040	0.0148
129	0.0190	0.0040	0.0150
130	0.0191	0.0041	0.0150
131	0.0193	0.0041	0.0152
132	0.0194	0.0041	0.0152
133	0.0195	0.0042	0.0154
134	0.0196	0.0042	0.0154
135	0.0198	0.0042	0.0156
136	0.0199	0.0042	0.0157
137	0.0201	0.0043	0.0158
138	0.0202	0.0043	0.0159
139	0.0204	0.0043	0.0161
140	0.0205	0.0044	0.0161
141	0.0207	0.0044	0.0163
142	0.0208	0.0044	0.0164
143	0.0210	0.0045	0.0166
144	0.0212	0.0045	0.0167
145	0.0143	0.0031	0.0113
146	0.0145	0.0031	0.0114
147	0.0147	0.0031	0.0116
148	0.0149	0.0032	0.0117
149	0.0151	0.0032	0.0119
150	0.0153	0.0032	0.0120
151	0.0156	0.0033	0.0122
152	0.0157	0.0033	0.0124
153	0.0160	0.0034	0.0126
154	0.0162	0.0034	0.0127
155	0.0165	0.0035	0.0130
156	0.0167	0.0036	0.0132
157	0.0171	0.0036	0.0135
158	0.0173	0.0037	0.0136
159	0.0177	0.0038	0.0139
160	0.0179	0.0038	0.0141
161	0.0184	0.0039	0.0145
162	0.0186	0.0040	0.0146
163	0.0191	0.0041	0.0150
164	0.0194	0.0041	0.0152
165	0.0199	0.0042	0.0157
166	0.0202	0.0043	0.0159
167	0.0209	0.0044	0.0164

168	0.0212	0.0045	0.0167
169	0.0219	0.0047	0.0172
170	0.0223	0.0047	0.0176
171	0.0231	0.0049	0.0182
172	0.0236	0.0050	0.0185
173	0.0245	0.0052	0.0193
174	0.0250	0.0053	0.0197
175	0.0261	0.0056	0.0206
176	0.0268	0.0057	0.0211
177	0.0281	0.0060	0.0221
178	0.0289	0.0061	0.0227
179	0.0305	0.0065	0.0240
180	0.0315	0.0067	0.0248
181	0.0336	0.0072	0.0265
182	0.0348	0.0074	0.0274
183	0.0376	0.0080	0.0296
184	0.0393	0.0084	0.0309
185	0.0438	0.0093	0.0345
186	0.0462	0.0098	0.0364
187	0.0525	0.0112	0.0413
188	0.0566	0.0120	0.0445
189	0.0682	0.0145	0.0537
190	0.0770	0.0150	0.0619
191	0.1100	0.0150	0.0950
192	0.1513	0.0150	0.1363
193	0.4736	0.0150	0.4585
194	0.0896	0.0150	0.0746
195	0.0617	0.0131	0.0485
196	0.0491	0.0104	0.0386
197	0.0412	0.0088	0.0324
198	0.0362	0.0077	0.0285
199	0.0325	0.0069	0.0256
200	0.0297	0.0063	0.0234
201	0.0274	0.0058	0.0216
202	0.0256	0.0054	0.0201
203	0.0240	0.0051	0.0189
204	0.0227	0.0048	0.0179
205	0.0215	0.0046	0.0170
206	0.0205	0.0044	0.0162
207	0.0196	0.0042	0.0155
208	0.0188	0.0040	0.0148
209	0.0181	0.0039	0.0143
210	0.0175	0.0037	0.0138
211	0.0169	0.0036	0.0133
212	0.0164	0.0035	0.0129
213	0.0159	0.0034	0.0125
214	0.0154	0.0033	0.0121
215	0.0150	0.0032	0.0118
216	0.0146	0.0031	0.0115
217	0.0213	0.0045	0.0168
218	0.0209	0.0045	0.0165
219	0.0206	0.0044	0.0162
220	0.0203	0.0043	0.0160
221	0.0200	0.0043	0.0157
222	0.0197	0.0042	0.0155
223	0.0194	0.0041	0.0153
224	0.0192	0.0041	0.0151
225	0.0189	0.0040	0.0149
226	0.0187	0.0040	0.0147
227	0.0185	0.0039	0.0145
228	0.0183	0.0039	0.0144
229	0.0181	0.0038	0.0142
230	0.0178	0.0038	0.0141
231	0.0177	0.0038	0.0139
232	0.0175	0.0037	0.0138
233	0.0173	0.0037	0.0136
234	0.0171	0.0036	0.0135
235	0.0170	0.0036	0.0133
236	0.0168	0.0036	0.0132
237	0.0166	0.0035	0.0131
238	0.0165	0.0035	0.0130
239	0.0163	0.0035	0.0129
240	0.0162	0.0034	0.0127

```
      241              0.0161           0.0034              0.0126
      242              0.0159           0.0034              0.0125
      243              0.0158           0.0034              0.0124
      244              0.0157           0.0033              0.0123
      245              0.0155           0.0033              0.0122
      246              0.0154           0.0033              0.0121
      247              0.0153           0.0033              0.0120
      248              0.0152           0.0032              0.0120
      249              0.0151           0.0032              0.0119
      250              0.0150           0.0032              0.0118
      251              0.0149           0.0032              0.0117
      252              0.0148           0.0031              0.0116
      253              0.0147           0.0031              0.0115
      254              0.0146           0.0031              0.0115
      255              0.0145           0.0031              0.0114
      256              0.0144           0.0031              0.0113
      257              0.0143           0.0030              0.0112
      258              0.0142           0.0030              0.0112
      259              0.0141           0.0030              0.0111
      260              0.0140           0.0030              0.0110
      261              0.0139           0.0030              0.0110
      262              0.0138           0.0029              0.0109
      263              0.0138           0.0029              0.0108
      264              0.0137           0.0029              0.0108
      265              0.0136           0.0029              0.0107
      266              0.0135           0.0029              0.0107
      267              0.0135           0.0029              0.0106
      268              0.0134           0.0028              0.0105
      269              0.0133           0.0028              0.0105
      270              0.0132           0.0028              0.0104
      271              0.0132           0.0028              0.0104
      272              0.0131           0.0028              0.0103
      273              0.0130           0.0028              0.0103
      274              0.0130           0.0028              0.0102
      275              0.0129           0.0027              0.0102
      276              0.0128           0.0027              0.0101
      277              0.0128           0.0027              0.0101
      278              0.0127           0.0027              0.0100
      279              0.0127           0.0027              0.0100
      280              0.0126           0.0027              0.0099
      281              0.0125           0.0027              0.0099
      282              0.0125           0.0027              0.0098
      283              0.0124           0.0026              0.0098
      284              0.0124           0.0026              0.0097
      285              0.0123           0.0026              0.0097
      286              0.0123           0.0026              0.0096
      287              0.0122           0.0026              0.0096
      288              0.0122           0.0026              0.0096
      --------------------------------------------------------------------
      --------------------------------------------------------------------
      Total soil rain loss =      1.14(In)
      Total effective rainfall =      4.76(In)
      Peak flow rate in flood hydrograph =     20.22(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
-----------------------------------------------------------------------
  0+ 5       0.0003      0.05  Q          |         |         |         |
  0+10       0.0025      0.32  Q          |         |         |         |
  0+15       0.0069      0.64  Q          |         |         |         |
  0+20       0.0122      0.77  VQ         |         |         |         |
  0+25       0.0177      0.80  VQ         |         |         |         |
  0+30       0.0233      0.81  VQ         |         |         |         |
  0+35       0.0289      0.82  VQ         |         |         |         |
  0+40       0.0346      0.82  VQ         |         |         |         |
  0+45       0.0402      0.82  VQ         |         |         |         |
  0+50       0.0459      0.82  VQ         |         |         |         |
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0+55       0.0515      0.82  VQ        |         |         |         |
1+ 0       0.0572      0.82  VQ        |         |         |         |
1+ 5       0.0629      0.83  VQ        |         |         |         |
1+10       0.0686      0.83  VQ        |         |         |         |
1+15       0.0743      0.83  |Q        |         |         |         |
1+20       0.0801      0.83  |Q        |         |         |         |
1+25       0.0858      0.83  |Q        |         |         |         |
1+30       0.0916      0.84  |Q        |         |         |         |
1+35       0.0973      0.84  |Q        |         |         |         |
1+40       0.1031      0.84  |Q        |         |         |         |
1+45       0.1089      0.84  |Q        |         |         |         |
1+50       0.1147      0.84  |Q        |         |         |         |
1+55       0.1206      0.85  |Q        |         |         |         |
2+ 0       0.1264      0.85  |Q        |         |         |         |
2+ 5       0.1323      0.85  |Q        |         |         |         |
2+10       0.1381      0.85  |Q        |         |         |         |
2+15       0.1440      0.85  |QV       |         |         |         |
2+20       0.1499      0.86  |QV       |         |         |         |
2+25       0.1558      0.86  |QV       |         |         |         |
2+30       0.1617      0.86  |QV       |         |         |         |
2+35       0.1677      0.86  |QV       |         |         |         |
2+40       0.1736      0.86  |QV       |         |         |         |
2+45       0.1796      0.87  |QV       |         |         |         |
2+50       0.1856      0.87  |QV       |         |         |         |
2+55       0.1916      0.87  |QV       |         |         |         |
3+ 0       0.1976      0.87  |QV       |         |         |         |
3+ 5       0.2036      0.88  |QV       |         |         |         |
3+10       0.2097      0.88  |Q V      |         |         |         |
3+15       0.2158      0.88  |Q V      |         |         |         |
3+20       0.2218      0.88  |Q V      |         |         |         |
3+25       0.2279      0.89  |Q V      |         |         |         |
3+30       0.2340      0.89  |Q V      |         |         |         |
3+35       0.2402      0.89  |Q V      |         |         |         |
3+40       0.2463      0.89  |Q V      |         |         |         |
3+45       0.2525      0.89  |Q V      |         |         |         |
3+50       0.2587      0.90  |Q V      |         |         |         |
3+55       0.2649      0.90  |Q V      |         |         |         |
4+ 0       0.2711      0.90  |Q V      |         |         |         |
4+ 5       0.2773      0.90  |Q V      |         |         |         |
4+10       0.2835      0.91  |Q  V     |         |         |         |
4+15       0.2898      0.91  |Q  V     |         |         |         |
4+20       0.2961      0.91  |Q  V     |         |         |         |
4+25       0.3024      0.92  |Q  V     |         |         |         |
4+30       0.3087      0.92  |Q  V     |         |         |         |
4+35       0.3151      0.92  |Q  V     |         |         |         |
4+40       0.3214      0.92  |Q  V     |         |         |         |
4+45       0.3278      0.93  |Q  V     |         |         |         |
4+50       0.3342      0.93  |Q  V     |         |         |         |
4+55       0.3406      0.93  |Q  V     |         |         |         |
5+ 0       0.3470      0.93  |Q  V     |         |         |         |
5+ 5       0.3535      0.94  |Q   V    |         |         |         |
5+10       0.3600      0.94  |Q   V    |         |         |         |
5+15       0.3665      0.94  |Q   V    |         |         |         |
5+20       0.3730      0.95  |Q   V    |         |         |         |
5+25       0.3795      0.95  |Q   V    |         |         |         |
5+30       0.3861      0.95  |Q   V    |         |         |         |
5+35       0.3926      0.95  |Q   V    |         |         |         |
5+40       0.3992      0.96  |Q   V    |         |         |         |
5+45       0.4059      0.96  |Q   V    |         |         |         |
5+50       0.4125      0.96  |Q   V    |         |         |         |
5+55       0.4192      0.97  |Q    V   |         |         |         |
6+ 0       0.4258      0.97  |Q    V   |         |         |         |
6+ 5       0.4326      0.97  |Q    V   |         |         |         |
6+10       0.4393      0.98  |Q    V   |         |         |         |
6+15       0.4460      0.98  |Q    V   |         |         |         |
6+20       0.4528      0.98  |Q    V   |         |         |         |
6+25       0.4596      0.99  |Q    V   |         |         |         |
6+30       0.4664      0.99  |Q    V   |         |         |         |
6+35       0.4733      0.99  |Q    V   |         |         |         |
6+40       0.4802      1.00  |Q    V   |         |         |         |
6+45       0.4870      1.00  |Q     V  |         |         |         |
6+50       0.4940      1.00  |Q     V  |         |         |         |
6+55       0.5009      1.01  |Q     V  |         |         |         |
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 7+ 0       0.5079      1.01  |Q     V  |         |         |         |
 7+ 5       0.5149      1.02  |Q     V  |         |         |         |
 7+10       0.5219      1.02  |Q     V  |         |         |         |
 7+15       0.5290      1.02  |Q     V  |         |         |         |
 7+20       0.5360      1.03  |Q     V  |         |         |         |
 7+25       0.5431      1.03  |Q     V  |         |         |         |
 7+30       0.5503      1.04  |Q     V  |         |         |         |
 7+35       0.5574      1.04  |Q      V |         |         |         |
 7+40       0.5646      1.04  |Q      V |         |         |         |
 7+45       0.5718      1.05  |Q      V |         |         |         |
 7+50       0.5791      1.05  |Q      V |         |         |         |
 7+55       0.5864      1.06  |Q      V |         |         |         |
 8+ 0       0.5937      1.06  |Q      V |         |         |         |
 8+ 5       0.6010      1.07  |Q      V |         |         |         |
 8+10       0.6084      1.07  |Q      V |         |         |         |
 8+15       0.6158      1.07  |Q      V |         |         |         |
 8+20       0.6232      1.08  |Q      V |         |         |         |
 8+25       0.6307      1.08  |Q       V|         |         |         |
 8+30       0.6382      1.09  |Q       V|         |         |         |
 8+35       0.6457      1.09  |Q       V|         |         |         |
 8+40       0.6533      1.10  |Q       V|         |         |         |
 8+45       0.6609      1.10  |Q       V|         |         |         |
 8+50       0.6685      1.11  |Q       V|         |         |         |
 8+55       0.6762      1.11  |Q       V|         |         |         |
 9+ 0       0.6839      1.12  |Q       V|         |         |         |
 9+ 5       0.6916      1.12  |Q       V|         |         |         |
 9+10       0.6994      1.13  |Q        V         |         |         |
 9+15       0.7072      1.14  |Q        V         |         |         |
 9+20       0.7151      1.14  |Q        V         |         |         |
 9+25       0.7230      1.15  |Q        V         |         |         |
 9+30       0.7309      1.15  |Q        V         |         |         |
 9+35       0.7389      1.16  |Q        V         |         |         |
 9+40       0.7469      1.16  |Q        V         |         |         |
 9+45       0.7550      1.17  |Q        V         |         |         |
 9+50       0.7631      1.18  |Q        V         |         |         |
 9+55       0.7712      1.18  |Q        |V        |         |         |
10+ 0       0.7794      1.19  |Q        |V        |         |         |
10+ 5       0.7876      1.20  |Q        |V        |         |         |
10+10       0.7959      1.20  |Q        |V        |         |         |
10+15       0.8042      1.21  |Q        |V        |         |         |
10+20       0.8126      1.22  |Q        |V        |         |         |
10+25       0.8210      1.22  |Q        |V        |         |         |
10+30       0.8295      1.23  |Q        |V        |         |         |
10+35       0.8380      1.24  |Q        | V       |         |         |
10+40       0.8466      1.25  |Q        | V       |         |         |
10+45       0.8552      1.25  |Q        | V       |         |         |
10+50       0.8639      1.26  |Q        | V       |         |         |
10+55       0.8727      1.27  |Q        | V       |         |         |
11+ 0       0.8815      1.28  |Q        | V       |         |         |
11+ 5       0.8903      1.29  |Q        | V       |         |         |
11+10       0.8992      1.29  |Q        | V       |         |         |
11+15       0.9082      1.30  |Q        |  V      |         |         |
11+20       0.9173      1.31  |Q        |  V      |         |         |
11+25       0.9264      1.32  |Q        |  V      |         |         |
11+30       0.9355      1.33  |Q        |  V      |         |         |
11+35       0.9448      1.34  |Q        |  V      |         |         |
11+40       0.9541      1.35  |Q        |  V      |         |         |
11+45       0.9634      1.36  |Q        |  V      |         |         |
11+50       0.9729      1.37  |Q        |  V      |         |         |
11+55       0.9824      1.38  |Q        |   V     |         |         |
12+ 0       0.9920      1.39  |Q        |   V     |         |         |
12+ 5       1.0015      1.38  |Q        |   V     |         |         |
12+10       1.0100      1.23  |Q        |   V     |         |         |
12+15       1.0172      1.05  |Q        |   V     |         |         |
12+20       1.0241      1.00  |Q        |   V     |         |         |
12+25       1.0309      0.99  |Q        |   V     |         |         |
12+30       1.0378      1.00  |Q        |   V     |         |         |
12+35       1.0447      1.01  |Q        |    V    |         |         |
12+40       1.0518      1.02  |Q        |    V    |         |         |
12+45       1.0589      1.04  |Q        |    V    |         |         |
12+50       1.0662      1.05  |Q        |    V    |         |         |
12+55       1.0736      1.07  |Q        |    V    |         |         |
13+ 0       1.0810      1.09  |Q        |    V    |         |         |
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13+ 5       1.0886      1.10  |Q        |    V    |         |         |
13+10       1.0964      1.12  |Q        |    V    |         |         |
13+15       1.1042      1.14  |Q        |    V    |         |         |
13+20       1.1122      1.16  |Q        |     V   |         |         |
13+25       1.1204      1.18  |Q        |     V   |         |         |
13+30       1.1287      1.20  |Q        |     V   |         |         |
13+35       1.1371      1.23  |Q        |     V   |         |         |
13+40       1.1457      1.25  |Q        |     V   |         |         |
13+45       1.1545      1.28  |Q        |     V   |         |         |
13+50       1.1635      1.30  |Q        |     V   |         |         |
13+55       1.1726      1.33  |Q        |     V   |         |         |
14+ 0       1.1820      1.36  |Q        |      V  |         |         |
14+ 5       1.1916      1.39  |Q        |      V  |         |         |
14+10       1.2014      1.43  |Q        |      V  |         |         |
14+15       1.2115      1.46  |Q        |      V  |         |         |
14+20       1.2219      1.50  | Q       |      V  |         |         |
14+25       1.2325      1.54  | Q       |      V  |         |         |
14+30       1.2434      1.59  | Q       |      V  |         |         |
14+35       1.2547      1.64  | Q       |       V |         |         |
14+40       1.2664      1.69  | Q       |       V |         |         |
14+45       1.2784      1.75  | Q       |       V |         |         |
14+50       1.2909      1.81  | Q       |       V |         |         |
14+55       1.3038      1.88  | Q       |       V |         |         |
15+ 0       1.3173      1.96  | Q       |       V |         |         |
15+ 5       1.3314      2.04  | Q       |        V|         |         |
15+10       1.3461      2.14  | Q       |        V|         |         |
15+15       1.3616      2.25  |  Q      |        V|         |         |
15+20       1.3780      2.38  |  Q      |        V|         |         |
15+25       1.3954      2.53  |  Q      |         V         |         |
15+30       1.4141      2.71  |  Q      |         V         |         |
15+35       1.4344      2.94  |  Q      |         V         |         |
15+40       1.4565      3.21  |   Q     |         V         |         |
15+45       1.4810      3.56  |   Q     |         |V        |         |
15+50       1.5088      4.04  |    Q    |         |V        |         |
15+55       1.5420      4.81  |     Q   |         | V       |         |
16+ 0       1.5858      6.37  |       Q |         | V       |         |
16+ 5       1.6578     10.45  |         |  Q      |  V      |         |
16+10       1.7911     19.35  |         |         |    Q    |         |
16+15       1.9304     20.22  |         |         |     QV  |         |
16+20       2.0029     10.53  |         |   Q     |       V |         |
16+25       2.0409      5.52  |      Q  |         |        V|         |
16+30       2.0664      3.71  |   Q     |         |        V|         |
16+35       2.0867      2.94  |  Q      |         |         V         |
16+40       2.1034      2.43  |  Q      |         |         V         |
16+45       2.1183      2.17  | Q       |         |         V         |
16+50       2.1319      1.97  | Q       |         |         V         |
16+55       2.1445      1.82  | Q       |         |         V         |
17+ 0       2.1562      1.70  | Q       |         |         |V        |
17+ 5       2.1672      1.59  | Q       |         |         |V        |
17+10       2.1775      1.51  | Q       |         |         |V        |
17+15       2.1874      1.43  |Q        |         |         |V        |
17+20       2.1968      1.36  |Q        |         |         |V        |
17+25       2.2058      1.30  |Q        |         |         |V        |
17+30       2.2144      1.25  |Q        |         |         |V        |
17+35       2.2227      1.20  |Q        |         |         |V        |
17+40       2.2307      1.16  |Q        |         |         | V       |
17+45       2.2384      1.12  |Q        |         |         | V       |
17+50       2.2459      1.09  |Q        |         |         | V       |
17+55       2.2532      1.05  |Q        |         |         | V       |
18+ 0       2.2602      1.02  |Q        |         |         | V       |
18+ 5       2.2673      1.03  |Q        |         |         | V       |
18+10       2.2752      1.15  |Q        |         |         | V       |
18+15       2.2843      1.32  |Q        |         |         | V       |
18+20       2.2938      1.37  |Q        |         |         |  V      |
18+25       2.3032      1.36  |Q        |         |         |  V      |
18+30       2.3124      1.35  |Q        |         |         |  V      |
18+35       2.3216      1.33  |Q        |         |         |  V      |
18+40       2.3306      1.31  |Q        |         |         |  V      |
18+45       2.3396      1.29  |Q        |         |         |  V      |
18+50       2.3484      1.28  |Q        |         |         |  V      |
18+55       2.3571      1.26  |Q        |         |         |  V      |
19+ 0       2.3656      1.25  |Q        |         |         |   V     |
19+ 5       2.3741      1.23  |Q        |         |         |   V     |
```

```
   19+10       2.3825      1.22  |Q        |         |         |   V     |
   19+15       2.3908      1.20  |Q        |         |         |   V     |
   19+20       2.3990      1.19  |Q        |         |         |   V     |
   19+25       2.4071      1.18  |Q        |         |         |   V     |
   19+30       2.4151      1.16  |Q        |         |         |   V     |
   19+35       2.4230      1.15  |Q        |         |         |   V     |
   19+40       2.4309      1.14  |Q        |         |         |   V     |
   19+45       2.4386      1.13  |Q        |         |         |    V    |
   19+50       2.4463      1.12  |Q        |         |         |    V    |
   19+55       2.4540      1.11  |Q        |         |         |    V    |
   20+ 0       2.4615      1.10  |Q        |         |         |    V    |
   20+ 5       2.4690      1.09  |Q        |         |         |    V    |
   20+10       2.4765      1.08  |Q        |         |         |    V    |
   20+15       2.4838      1.07  |Q        |         |         |    V    |
   20+20       2.4912      1.06  |Q        |         |         |    V    |
   20+25       2.4984      1.05  |Q        |         |         |    V    |
   20+30       2.5056      1.04  |Q        |         |         |     V   |
   20+35       2.5127      1.04  |Q        |         |         |     V   |
   20+40       2.5198      1.03  |Q        |         |         |     V   |
   20+45       2.5268      1.02  |Q        |         |         |     V   |
   20+50       2.5338      1.01  |Q        |         |         |     V   |
   20+55       2.5407      1.00  |Q        |         |         |     V   |
   21+ 0       2.5476      1.00  |Q        |         |         |     V   |
   21+ 5       2.5544      0.99  |Q        |         |         |     V   |
   21+10       2.5612      0.98  |Q        |         |         |     V   |
   21+15       2.5679      0.98  |Q        |         |         |     V   |
   21+20       2.5746      0.97  |Q        |         |         |      V  |
   21+25       2.5812      0.96  |Q        |         |         |      V  |
   21+30       2.5878      0.96  |Q        |         |         |      V  |
   21+35       2.5944      0.95  |Q        |         |         |      V  |
   21+40       2.6009      0.95  |Q        |         |         |      V  |
   21+45       2.6074      0.94  |Q        |         |         |      V  |
   21+50       2.6138      0.93  |Q        |         |         |      V  |
   21+55       2.6202      0.93  |Q        |         |         |      V  |
   22+ 0       2.6266      0.92  |Q        |         |         |      V  |
   22+ 5       2.6329      0.92  |Q        |         |         |      V  |
   22+10       2.6392      0.91  |Q        |         |         |      V  |
   22+15       2.6454      0.91  |Q        |         |         |       V |
   22+20       2.6516      0.90  |Q        |         |         |       V |
   22+25       2.6578      0.90  |Q        |         |         |       V |
   22+30       2.6640      0.89  |Q        |         |         |       V |
   22+35       2.6701      0.89  |Q        |         |         |       V |
   22+40       2.6762      0.88  |Q        |         |         |       V |
   22+45       2.6822      0.88  |Q        |         |         |       V |
   22+50       2.6882      0.87  |Q        |         |         |       V |
   22+55       2.6942      0.87  |Q        |         |         |       V |
   23+ 0       2.7002      0.86  |Q        |         |         |       V |
   23+ 5       2.7061      0.86  |Q        |         |         |       V |
   23+10       2.7120      0.86  |Q        |         |         |        V|
   23+15       2.7179      0.85  |Q        |         |         |        V|
   23+20       2.7237      0.85  |Q        |         |         |        V|
   23+25       2.7295      0.84  |Q        |         |         |        V|
   23+30       2.7353      0.84  |Q        |         |         |        V|
   23+35       2.7410      0.84  |Q        |         |         |        V|
   23+40       2.7468      0.83  |Q        |         |         |        V|
   23+45       2.7525      0.83  |Q        |         |         |        V|
   23+50       2.7582      0.82  |Q        |         |         |        V|
   23+55       2.7638      0.82  |Q        |         |         |        V|
   24+ 0       2.7694      0.82  |Q        |         |         |        V|
   24+ 5       2.7747      0.76  |Q        |         |         |        V|
   24+10       2.7781      0.50  Q         |         |         |        V|
   24+15       2.7793      0.17  Q         |         |         |        V|
   24+20       2.7796      0.04  Q         |         |         |        V|
   24+25       2.7797      0.01  Q         |         |         |        V|
   24+30       2.7797      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
```

ATTACHMENT 5

Hydraulics

6’ Parkway Culvert Capacity
24in Highway Grate Inlet Capacity

```
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
.                Joseph E. Bonadiman & Assoc., Inc.                 .
.                       Consulting Engineers                        .
.                       234 N. Arrowhead Ave.                       .
.                 San Bernardino, California 92408                  .
.                           (909)885-3806                           .
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
```

6' PARKWAY CULVERT MAX. FLOW CAPACITY

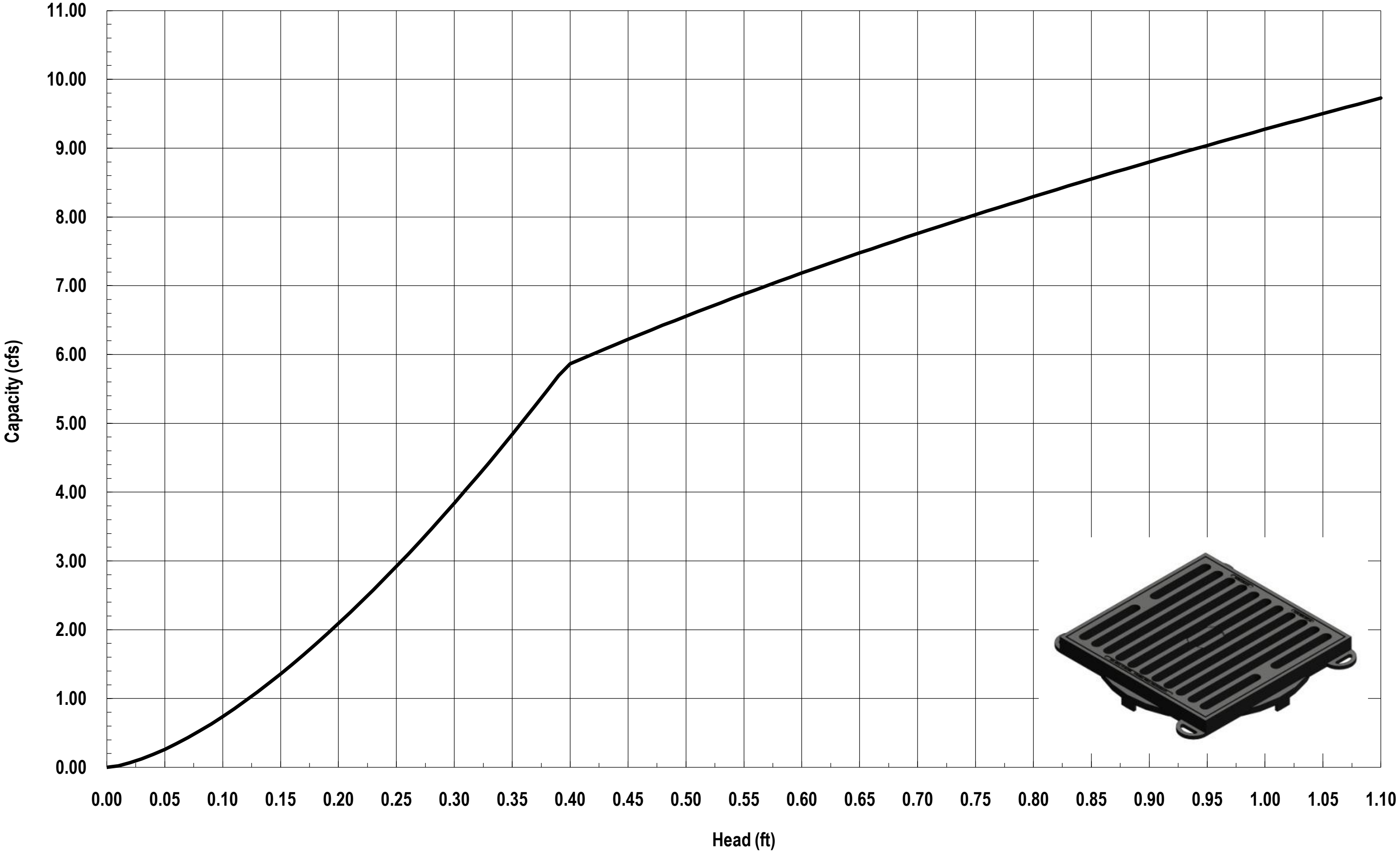
```
                  |<--------(  6.00')---------->|
                  |                             |
          * * * * *                             * * * * *
                * *                             * *
                * *^^^Water Surface (  0.25')^^^* *
                * *                             * *
                * *                             * *
                * *                             * *
                * * * * * * * * * * * * * * * * * *
                * * * * * * * * * * * * * * * * * *



                      Rectangular Open Channel
                      ------------------------


      Flowrate ..................        9.123  CFS
      Velocity ..................        6.082  fps
      Depth of Flow .............        0.250  feet
      Critical Depth ............        0.416  feet
      Total Depth ...............        0.250  feet
      Base Width ................        6.000  feet
      Slope of Channel ..........        2.000  %
      X-Sectional Area ..........        1.500  sq. ft.
      Wetted Perimeter ..........        6.500  feet
      AR^(2/3) ..................        0.564
      Mannings 'n' ..............        0.013
```

Nyloplast 2' x 2' Road & Highway Grate Inlet Capacity Chart



Nyloplast®
3130 Verona Avenue • Buford, GA 30518
(866) 888-8479 / (770) 932-2443 • Fax: (770) 932-2490

Appendix F
Approved Traffic Scoping Agreement

City of San Bernardino Public Works / Traffic Engineering Department
Traffic Scope Approval Form

To be completed by applicant consultant and approved by Public Works prior to start of study

---

Project DP-D21-06
Name: Project 776 W. Mill Street Warehouse
Address: Project
Description: truck sales, service/repair, and parts sales dealership on 7.08-acre site (5,950 SF bldg)
Developer's Name: Representative (Lilburn Corporation)
Address:
Telephone No. ____________ **Email address:** ____________

Trip Generation Rates from ITE Latest Edition

Land Use (1) Existing Driveway Counts
Development Sq Ft ____________
ITE Land Use Code ____________
Daily Trips 62 (PCE)
AM Peak Hour Trips
Inbound 3
Outbound 1
Total 4 (PCE)
PM Peak Hour Trips
Inbound 1
Outbound 2
Total 3 (PCE)

Land Use (2) ____________
Development Sq Ft ____________
ITE Land Use Code ____________
Daily Trips ____________
AM Peak Hour Trips
Inbound ____________
Outbound ____________
Total ____________
PM Peak Hour Trips
Inbound ____________
Outbound ____________
Total ____________

(Use Additional Sheet(s), if necessary)

Pass-by Trips (%), if applicable: N/A %

Land Use (1) ____________
ITE Land Use Code ____________
Daily Trips ____________
AM Peak Hour Trips
Inbound ____________
Outbound ____________
Total ____________
PM Peak Hour Trips:
Inbound ____________
Outbound ____________
Total ____________

Land Use (2) ____________
ITE Land Use Code ____________
Daily Trips ____________
AM Peak Hour Trips
Inbound ____________
Outbound ____________
Total ____________
PM Peak Hour Trips:
Inbound ____________
Outbound ____________
Total ____________

Project Opening Year: ____________ **Build-out Year:** ____________
Study Intersections: 1 Not Applicable
2 ____________
3 ____________
4 ____________
5 ____________
6 ____________
7 ____________
8 ____________
9 ____________
10 ____________

(Use Additional Sheet(s) and Maps to show project Boundaries & Attach memo for project Description)

City of San Bernardino Public Works / Traffic Engineering Department

Traffic Scope Approval Form

To be completed by applicant consultant and approved by Public Works prior to start of study

---

Study Roadway Segments: 1 Not Applicable 2 ______
3 ______ 4 ______
5 ______ 6 ______

Proposed Development Use: ☐ Residential ☐ Commercial ☐ Mixed Use ☒ Other

Software Methodology: ☐ Synchro ☐ HCS

Additional issues to be considered: ☐ Traffic calming measures ☐ Queuing Analysis
☐ Bike/Ped Accommodations ☐ Merge Analysis ☐ Gap Analysis
☐ Actuation/Coordination ☐ Safety Analysis ☐ Sight Distance Analysis

Is the project screened from VMT assessment? ☒ Yes ☐ No

VMT Screening Justification: VMT Screening Memo prepared - Project Type Screening met

Ambient Growth Rate: ______%

Trip Distribution: East ______% West ______% North ______% South ______%

Consultant Preparer's Name: Charlene So, Urban Crossroads, Inc.

Address: 1133 Camelback St. #8329, Newport Beach, CA 92658

Telephone No. 949-861-0177 **PE / TE License #:** TR2414

Email Address: cso@urbanxroads.com

Signature: Charlene So **Date:** July14, 2021

Approved By (Public Works Department):

Signature: ______ **Date:** 08/02/2021

Name: Azzam Jabsheh **Title:** Traffic Engineer

Attached:
Exhibit 1: Location Map
Exhibit 2: Preliminary Site Plan

No TIA is required Trips below thresholds

URBAN
CROSSROADS
urbanxroads.com

July 14, 2021

Mr. Azzam Jabsheh
City of San Bernardino
201 N. E St.
San Bernardino, CA 92401

SUBJECT: 776 W. MILL STREET TRIP GENERATION ASSESSMENT

Dear Mr. Azzam Jabsheh:

Urban Crossroads, Inc. is pleased to provide the following Trip Generation Assessment for 776 W. Mill Street development (**Project**) which is located in the City of San Bernardino. The purpose of this work effort is to determine whether additional traffic analysis is necessary for the proposed Project based on the City of San Bernardino's Traffic Impact Analysis Guidelines (dated August 2020) (**City Guidelines**).

PROPOSED PROJECT

The proposed Project is to allow the construction and operation of a truck sales, service/repair, and parts sales dealership on a 7.08-acre site located in the City of San Bernardino (APN's 0136-151-06, 09, 11, 19 & 0136-142-02) (see Exhibit 1). The developable area is approximately 5-acres. Specifically, the Project is located at 776 W. Mill Street (see Exhibit 2). The Project includes the construction and operation of a 5,950 square foot building. Proposed parking includes 7 employee (passenger car) parking spaces, 21 truck parking spaces (11.5-feet x 30-feet), and 168 trailer parking spaces (11.5-feet x 55-feet) for a total of 196 spaces.

It is anticipated that the proposed Project will support the activities at another facility located at 14400 Randall Avenue in Fontana, California. The Project anticipates the following average weekday daily vehicular traffic:

- 2 full-time employees per day
- 1 customer-related trip per day
- 2 pick-up/delivery trips per day
- 4 truck/trailer trips per day

The Project is proposed to take access from Mill Street via a right-in/right-out access only driveway.

PROJECT TRIP GENERATION

DEVELOPMENT OF TRIP GENERATION RATES

Due to the unique nature of the proposed Project, the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition, 2017) does not appear to be the best source for calculating the Project's trip generation. As such, trip generation estimates for the proposed Project have been developed using data collected at a similar facility located at 14400 Randall Avenue in Fontana, California which this proposed Project will support/interact with. The facility located at 14400 Randall Avenue is 169,260 square feet. Table 1 summarizes the count data collected at 14400 Randall Avenue on June 8th and June 9th, 2021. The actual driveway counts have been attached to this trip generation assessment (see Attachment A).

TABLE 1: EMPIRICAL DATA FOR EXISTING FACILITY

		AM Peak Hour			PM Peak Hour			
Land Use[1]	Units[2]	In	Out	Total	In	Out	Total	Daily
Actual Vehicle Trip Generation Rates								
TEC Equipment[3]	TSF							
Passenger Cars		0.266	0.103	0.369	0.198	0.369	0.567	6.233
2-Axle Trucks		0.006	0.012	0.018	0.024	0.012	0.035	0.476
3-Axle Trucks		0.044	0.032	0.077	0.015	0.030	0.044	0.691
4+-Axle Trucks		0.015	0.015	0.030	0.012	0.018	0.030	0.443
Passenger Car Equivalent (PCE) Trip Generation Rates[4]								
TEC Equipment[3]	TSF							
Passenger Cars		0.266	0.103	0.369	0.198	0.369	0.567	6.233
2-Axle Trucks (PCE = 2.0)		0.012	0.024	0.035	0.047	0.024	0.071	0.951
3-Axle Trucks (PCE = 2.5)		0.111	0.081	0.192	0.037	0.074	0.111	1.728
4+-Axle Trucks (PCE = 3.0)		0.044	0.044	0.089	0.035	0.053	0.089	1.329

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Tenth Edition (2017).

[2] TSF = thousand square feet

[3] Trip generation rates based on empirical data (see Attachment A).

[4] PCE factors per City Guidelines: 2-axle = 2.0; 3-axle = 2.5; 4+-axle = 3.0.

The average trip rate has been calculated by averaging the data collected over two days. A passenger-car equivalent (PCE) of 2.0, 2.5, and 3.0 have been applied to 2-axle, 3-axle, and 4+-axle vehicles, consistent with the City's traffic study guidelines. PCE rates were calculated by taking the actual vehicle trip generation rates and applying the PCE factors shown in Table 1.

PROPOSED PROJECT TRIP GENERATION

Based on the calculated average trip generation rates shown on Table 1, the Project's trip generation is summarized on Table 2. Trip generation was calculated by multiplying the proposed square footage of the on-site building (5,950 square feet) by the rates shown on Table 1. As shown on Table 2, the Project is anticipated to generate a total of 62 two-way PCE trips per day with 4 AM PCE peak hour trips and 3 PM PCE peak hour trips. This trip generation data is reasonable in light of the vehicular activity anticipated for the site.

TABLE 2: PROJECT TRIP GENERATION SUMMARY

		AM Peak Hour			PM Peak Hour			
Land Use	**Quantity Units**[1]	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**Daily**
Actual Vehicles:								
776 W. Mill Street	5.950 TSF							
Passenger Cars:		2	1	2	1	2	3	38
2-axle Trucks:		0	0	0	0	0	0	4
3-axle Trucks:		0	0	0	0	0	0	4
4+-axle Trucks:		0	0	0	0	0	0	4
Total Truck Trips (Actual Vehicles):		0	0	0	0	0	0	12
Total Trips (Actual Vehicles)[2]		**2**	**1**	**2**	**1**	**2**	**3**	**50**
Passenger Car Equivalent (PCE):								
776 W. Mill Street	5.950 TSF							
Passenger Cars:		2	1	2	1	2	3	38
2-axle Trucks:		0	0	0	0	0	0	6
3-axle Trucks:		1	0	1	0	0	0	10
4+-axle Trucks:		0	0	0	0	0	0	8
Total Truck Trips (PCE):		1	0	1	0	0	0	24
Total Trips (PCE)[2]		**3**	**1**	**4**	**1**	**2**	**3**	**62**

[1] TSF = thousand square feet

[2] Total Trips = Passenger Cars + Truck Trips.

FINDINGS

The Project is anticipated to generate fewer than 50 peak hour trips (both actual and PCE based). In other words, the proposed Project is anticipated to generate fewer than 50 peak hour trips, so there would be less than 50 peak hour trips contributed to any driveway and off-site study area intersection. As such, a level of service (LOS) based traffic analysis is not required for this Project based on the City of San Bernardino's Guidelines. If you have any questions, please contact me directly at (949) 861-0177.

Respectfully submitted,

URBAN CROSSROADS, INC.

Charlene So

Charlene So, PE
Associate Principal

EXHIBIT 1: LOCATION MAP

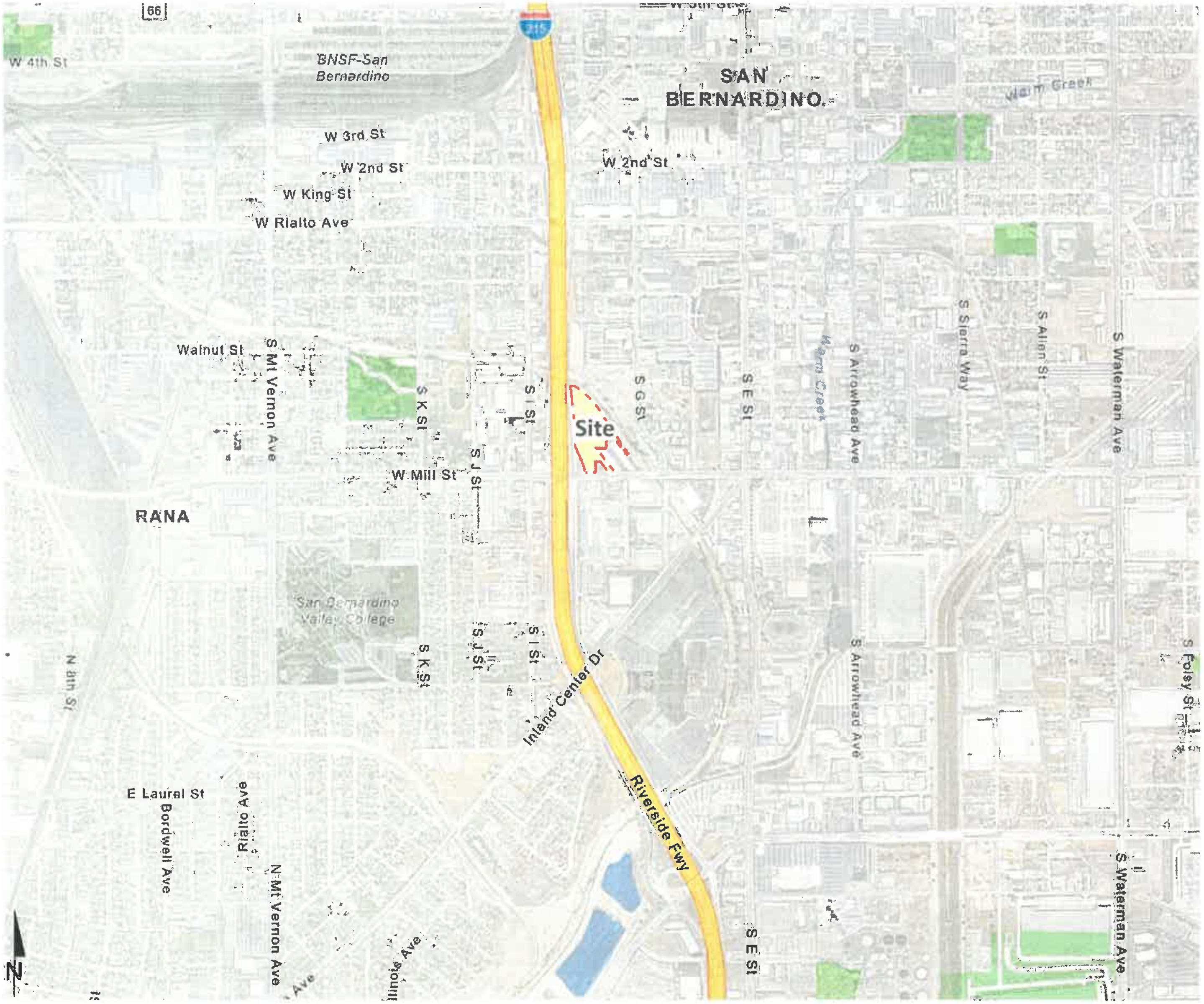
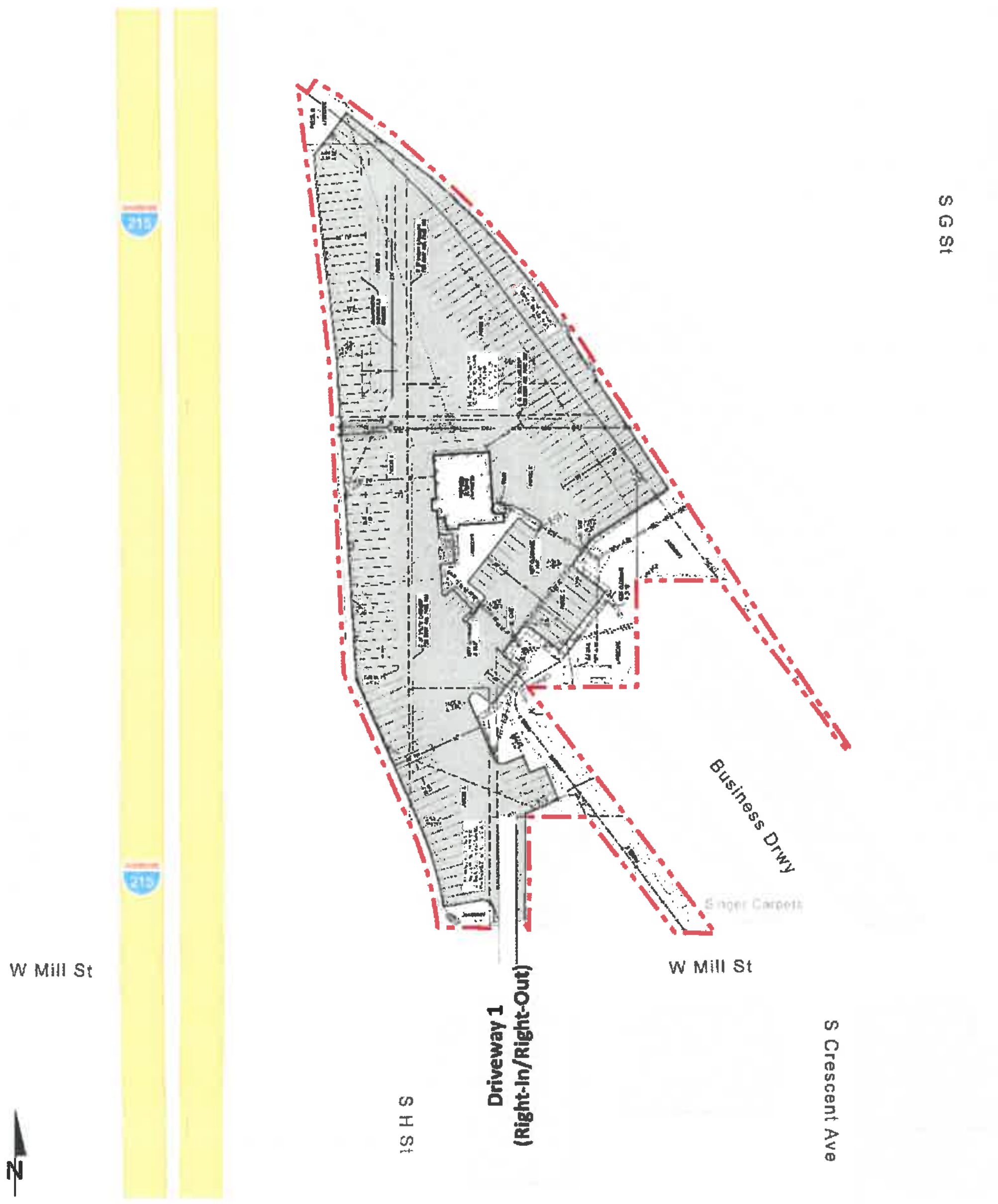


EXHIBIT 2: PRELIMINARY SITE PLAN



ATTACHMENT A: DRIVEWAY COUNT DATA FOR JUNE 8TH AND 9TH, 2021 AT 14400 RANDALL AVENUE, FONTANA, CA

Table A-1

Summary of Driveway Counts: 14400 Randall Avenue, Fontana, CA

	West Driveway							East Driveway						
	AM Peak Hour			PM Peak Hour				AM Peak Hour			PM Peak Hour			
Land Use	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**Daily**
Day 1: June 8, 2021														
Passenger Cars:	45	17	62	35	64	99	1,069	0	0	0	0	0	0	0
2-axle Trucks:	1	2	3	4	1	5	85	0	0	0	0	0	0	0
3-axle Trucks:	11	8	19	5	6	11	134	0	0	0	0	0	0	0
4+-axle Trucks:	4	1	5	1	4	5	79	0	0	0	0	0	0	0
Total Truck Trips:	16	11	27	10	11	21	298	0	0	0	0	0	0	0
Total Trips[1]	**61**	**28**	**89**	**45**	**75**	**120**	**1,367**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Day 2: June 9, 2021														
Passenger Cars:	45	18	63	32	61	93	1,041	0	0	0	0	0	0	0
2-axle Trucks:	1	2	3	4	3	7	76	0	0	0	0	0	0	0
3-axle Trucks:	4	3	7	0	4	4	100	0	0	0	0	0	0	0
4+-axle Trucks:	1	4	5	3	2	5	71	0	0	0	0	0	0	0
Total Truck Trips:	6	9	15	7	9	16	247	0	0	0	0	0	0	0
Total Trips[1]	**51**	**27**	**78**	**39**	**70**	**109**	**1,288**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

[1] Total Trips = Passenger Cars + Total Truck Trips.

Table A-2

Existing Empirical Data

	AM Peak Hour			PM Peak Hour			
Land Use	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**Daily**
Day 1: June 8, 2021							
Passenger Cars:	45	17	62	35	64	99	1,069
2-axle Trucks:	1	2	3	4	1	5	85
3-axle Trucks:	11	8	19	5	6	11	134
4+-axle Trucks:	4	1	5	1	4	5	79
Total Truck Trips:	16	11	27	10	11	21	298
Total Trips[1]	61	28	89	45	75	120	1,367
Day 2: June 9, 2021							
Passenger Cars:	45	18	63	32	61	93	1,041
2-axle Trucks:	1	2	3	4	3	7	76
3-axle Trucks:	4	3	7	0	4	4	100
4+-axle Trucks:	1	4	5	3	2	5	71
Total Truck Trips:	6	9	15	7	9	16	247
Total Trips[1]	51	27	78	39	70	109	1,288
2-Day Average Trip Generation:							
Passenger Cars:	45	18	63	34	63	96	1,055
2-axle Trucks:	1	2	3	4	2	6	81
3-axle Trucks:	8	6	13	3	5	8	117
4+-axle Trucks:	3	3	5	2	3	5	75
Total Truck Trips:	11	10	21	9	10	19	273
Total Trips[1]	**56**	**28**	**84**	**42**	**73**	**115**	**1,328**

* Note: data collected on June 8 and 9, 2021.

[1] Total Trips = Passenger Cars + Total Truck Trips.

[2] Trip generation represents the sum of all driveways, by day.

Table A-3

Calculated Trip Generation Rates

Land Use	Units[1]	AM Peak Hour			PM Peak Hour			
		In	Out	Total	In	Out	Total	Daily
TEC Equipment[2]	TSF							
Passenger Cars:		0.266	0.103	0.369	0.198	0.369	0.567	6.233
2-axle Trucks:		0.006	0.012	0.018	0.024	0.012	0.035	0.476
3-axle Trucks:		0.044	0.032	0.077	0.015	0.030	0.044	0.691
4+-axle Trucks:		0.015	0.015	0.030	0.012	0.018	0.030	0.443

[1] TSF = Thousand Square Feet

[2] Trip generation rates developed from data summarized on Table A-1: Divide the 2 day average total by the number thousand square feet.

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/8/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	0	0	0	0	0
0:15	0	0	0	0	0
0:30	0	0	0	0	0
0:45	0	0	0	0	0
1:00	0	0	0	0	0
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	1	0	0	0	1
4:45	0	0	0	0	0
5:00	0	0	0	0	0
5:15	1	0	0	0	1
5:30	0	0	0	0	0
5:45	2	0	0	0	2
6:00	4	0	0	0	4
6:15	2	0	0	0	2
6:30	10	0	2	2	14
6:45	21	0	0	0	21
7:00	18	0	1	0	19
7:15	6	1	0	0	7
7:30	12	1	0	1	14
7:45	10	0	0	1	11
8:00	16	0	6	1	23
8:15	11	1	2	1	15
8:30	8	0	3	1	12
8:45	7	1	1	1	10
9:00	10	1	1	1	13
9:15	11	2	4	0	17
9:30	10	0	1	0	11
9:45	8	2	2	1	13
10:00	9	1	1	1	12
10:15	9	1	0	0	10
10:30	10	2	2	0	14
10:45	9	0	0	4	13
11:00	14	1	0	1	16
11:15	22	2	2	0	26
11:30	13	1	1	0	15
11:45	10	1	1	1	13

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	4	0	0	0	4
0:15	1	0	0	0	1
0:30	1	0	0	0	1
0:45	0	0	0	0	0
1:00	0	0	0	0	0
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	0	0	0	0	0
4:45	0	0	0	0	0
5:00	0	0	0	0	0
5:15	0	0	0	0	0
5:30	1	0	0	0	1
5:45	0	0	0	0	0
6:00	0	0	0	0	0
6:15	0	0	0	0	0
6:30	0	0	1	0	1
6:45	0	0	0	0	0
7:00	6	1	1	1	9
7:15	2	1	0	0	3
7:30	4	0	0	1	5
7:45	4	0	0	0	4
8:00	6	1	2	0	9
8:15	3	1	2	0	6
8:30	4	0	4	1	9
8:45	3	1	0	0	4
9:00	14	1	2	1	18
9:15	7	1	1	0	9
9:30	12	0	2	2	16
9:45	9	0	2	0	11
10:00	6	1	2	1	10
10:15	8	1	1	0	10
10:30	7	1	3	0	11
10:45	10	2	0	2	14
11:00	13	1	0	2	16
11:15	12	0	0	2	14
11:30	10	0	1	2	13
11:45	13	1	0	0	14

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/8/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	17	3	2	2	24
12:15	10	1	1	1	13
12:30	12	2	0	0	14
12:45	11	2	1	0	14
13:00	10	1	0	4	15
13:15	15	1	1	1	18
13:30	14	1	0	1	16
13:45	8	0	1	2	11
14:00	7	0	4	0	11
14:15	10	1	0	0	11
14:30	8	0	1	0	9
14:45	11	1	1	1	14
15:00	8	1	0	0	9
15:15	8	3	2	1	14
15:30	10	1	3	2	16
15:45	5	1	2	1	9
16:00	13	1	3	1	18
16:15	7	0	2	0	9
16:30	3	2	0	0	5
16:45	12	1	0	0	13
17:00	6	0	1	0	7
17:15	4	0	1	0	5
17:30	8	0	1	0	9
17:45	4	2	0	0	6
18:00	4	0	0	0	4
18:15	3	1	3	0	7
18:30	2	0	1	1	4
18:45	6	0	0	0	6
19:00	3	0	1	1	5
19:15	4	0	0	0	4
19:30	3	0	2	1	6
19:45	3	0	0	0	3
20:00	4	0	0	0	4
20:15	1	0	1	1	3
20:30	4	0	0	0	4
20:45	1	0	0	1	2
21:00	1	0	0	0	1
21:15	0	0	1	0	1
21:30	0	0	0	0	0
21:45	1	0	0	0	1
22:00	1	0	0	0	1
22:15	1	0	0	0	1
22:30	1	0	0	0	1
22:45	0	0	0	0	0
23:00	0	0	0	0	0
23:15	0	0	0	0	0
23:30	0	0	0	0	0
23:45	1	0	0	0	1
TOTAL	**529**	**44**	**66**	**39**	**678**

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	11	1	3	2	17
12:15	13	1	1	2	17
12:30	13	3	2	0	18
12:45	11	1	1	0	13
13:00	12	5	2	0	19
13:15	8	0	1	1	10
13:30	19	1	2	1	23
13:45	10	1	4	1	16
14:00	10	1	0	0	11
14:15	16	0	2	1	19
14:30	10	0	3	1	14
14:45	3	1	1	1	6
15:00	10	1	1	2	14
15:15	19	1	1	0	21
15:30	24	1	1	1	27
15:45	12	3	0	1	16
16:00	23	0	4	2	29
16:15	10	0	1	1	12
16:30	21	0	1	1	23
16:45	10	1	0	0	11
17:00	17	0	0	0	17
17:15	13	1	0	1	15
17:30	11	0	1	0	12
17:45	7	0	1	0	8
18:00	7	1	1	0	9
18:15	4	0	1	0	5
18:30	3	0	0	0	3
18:45	6	0	0	0	6
19:00	6	2	0	0	8
19:15	3	0	0	0	3
19:30	9	0	4	1	14
19:45	7	1	0	1	9
20:00	2	0	1	1	4
20:15	4	0	0	1	5
20:30	0	0	1	0	1
20:45	3	0	2	0	5
21:00	2	0	0	1	3
21:15	0	0	0	1	1
21:30	6	0	0	0	6
21:45	0	0	0	0	0
22:00	2	0	1	0	3
22:15	1	0	0	0	1
22:30	1	0	0	0	1
22:45	0	0	0	0	0
23:00	0	0	0	0	0
23:15	0	0	0	0	0
23:30	0	0	0	0	0
23:45	1	0	0	0	1
	540	**41**	**68**	**40**	**689**

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/8/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	0	0	0	0	0
0:15	0	0	0	0	0
0:30	0	0	0	0	0
0:45	0	0	0	0	0
1:00	0	0	0	0	0
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	0	0	0	0	0
4:45	0	0	0	0	0
5:00	0	0	0	0	0
5:15	0	0	0	0	0
5:30	0	0	0	0	0
5:45	0	0	0	0	0
6:00	0	0	0	0	0
6:15	0	0	0	0	0
6:30	0	0	0	0	0
6:45	0	0	0	0	0
7:00	0	0	0	0	0
7:15	0	0	0	0	0
7:30	0	0	0	0	0
7:45	0	0	0	0	0
8:00	0	0	0	0	0
8:15	0	0	0	0	0
8:30	0	0	0	0	0
8:45	0	0	0	0	0
9:00	0	0	0	0	0
9:15	0	0	0	0	0
9:30	0	0	0	0	0
9:45	0	0	0	0	0
10:00	0	0	0	0	0
10:15	0	0	0	0	0
10:30	0	0	0	0	0
10:45	0	0	0	0	0
11:00	0	0	0	0	0
11:15	0	0	0	0	0
11:30	0	0	0	0	0
11:45	0	0	0	0	0

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	0	0	0	0	0
0:15	0	0	0	0	0
0:30	0	0	0	0	0
0:45	0	0	0	0	0
1:00	0	0	0	0	0
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	0	0	0	0	0
4:45	0	0	0	0	0
5:00	0	0	0	0	0
5:15	0	0	0	0	0
5:30	0	0	0	0	0
5:45	0	0	0	0	0
6:00	0	0	0	0	0
6:15	0	0	0	0	0
6:30	0	0	0	0	0
6:45	0	0	0	0	0
7:00	0	0	0	0	0
7:15	0	0	0	0	0
7:30	0	0	0	0	0
7:45	0	0	0	0	0
8:00	0	0	0	0	0
8:15	0	0	0	0	0
8:30	0	0	0	0	0
8:45	0	0	0	0	0
9:00	0	0	0	0	0
9:15	0	0	0	0	0
9:30	0	0	0	0	0
9:45	0	0	0	0	0
10:00	0	0	0	0	0
10:15	0	0	0	0	0
10:30	0	0	0	0	0
10:45	0	0	0	0	0
11:00	0	0	0	0	0
11:15	0	0	0	0	0
11:30	0	0	0	0	0
11:45	0	0	0	0	0

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/8/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	0	0	0	0	0
12:15	0	0	0	0	0
12:30	0	0	0	0	0
12:45	0	0	0	0	0
13:00	0	0	0	0	0
13:15	0	0	0	0	0
13:30	0	0	0	0	0
13:45	0	0	0	0	0
14:00	0	0	0	0	0
14:15	0	0	0	0	0
14:30	0	0	0	0	0
14:45	0	0	0	0	0
15:00	0	0	0	0	0
15:15	0	0	0	0	0
15:30	0	0	0	0	0
15:45	0	0	0	0	0
16:00	0	0	0	0	0
16:15	0	0	0	0	0
16:30	0	0	0	0	0
16:45	0	0	0	0	0
17:00	0	0	0	0	0
17:15	0	0	0	0	0
17:30	0	0	0	0	0
17:45	0	0	0	0	0
18:00	0	0	0	0	0
18:15	0	0	0	0	0
18:30	0	0	0	0	0
18:45	0	0	0	0	0
19:00	0	0	0	0	0
19:15	0	0	0	0	0
19:30	0	0	0	0	0
19:45	0	0	0	0	0
20:00	0	0	0	0	0
20:15	0	0	0	0	0
20:30	0	0	0	0	0
20:45	0	0	0	0	0
21:00	0	0	0	0	0
21:15	0	0	0	0	0
21:30	0	0	0	0	0
21:45	0	0	0	0	0
22:00	0	0	0	0	0
22:15	0	0	0	0	0
22:30	0	0	0	0	0
22:45	0	0	0	0	0
23:00	0	0	0	0	0
23:15	0	0	0	0	0
23:30	0	0	0	0	0
23:45	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	0	0	0	0	0
12:15	0	0	0	0	0
12:30	0	0	0	0	0
12:45	0	0	0	0	0
13:00	0	0	0	0	0
13:15	0	0	0	0	0
13:30	0	0	0	0	0
13:45	0	0	0	0	0
14:00	0	0	0	0	0
14:15	0	0	0	0	0
14:30	0	0	0	0	0
14:45	0	0	0	0	0
15:00	0	0	0	0	0
15:15	0	0	0	0	0
15:30	0	0	0	0	0
15:45	0	0	0	0	0
16:00	0	0	0	0	0
16:15	0	0	0	0	0
16:30	0	0	0	0	0
16:45	0	0	0	0	0
17:00	0	0	0	0	0
17:15	0	0	0	0	0
17:30	0	0	0	0	0
17:45	0	0	0	0	0
18:00	0	0	0	0	0
18:15	0	0	0	0	0
18:30	0	0	0	0	0
18:45	0	0	0	0	0
19:00	0	0	0	0	0
19:15	0	0	0	0	0
19:30	0	0	0	0	0
19:45	0	0	0	0	0
20:00	0	0	0	0	0
20:15	0	0	0	0	0
20:30	0	0	0	0	0
20:45	0	0	0	0	0
21:00	0	0	0	0	0
21:15	0	0	0	0	0
21:30	0	0	0	0	0
21:45	0	0	0	0	0
22:00	0	0	0	0	0
22:15	0	0	0	0	0
22:30	0	0	0	0	0
22:45	0	0	0	0	0
23:00	0	0	0	0	0
23:15	0	0	0	0	0
23:30	0	0	0	0	0
23:45	0	0	0	0	0
	0	**0**	**0**	**0**	**0**

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/9/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	0	0	0	0	0
0:15	0	0	0	0	0
0:30	0	0	0	0	0
0:45	0	0	0	0	0
1:00	1	0	0	0	1
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	0	0	0	0	0
4:45	1	0	0	0	1
5:00	0	0	0	0	0
5:15	0	0	0	0	0
5:30	2	0	0	0	2
5:45	0	0	0	0	0
6:00	4	0	0	0	4
6:15	8	0	0	1	9
6:30	10	0	1	0	11
6:45	15	0	1	0	16
7:00	20	0	0	0	20
7:15	12	0	1	0	13
7:30	10	0	2	2	14
7:45	13	0	1	1	15
8:00	12	0	0	0	12
8:15	11	0	0	0	11
8:30	8	0	0	1	9
8:45	14	1	4	0	19
9:00	12	0	3	0	15
9:15	13	2	0	1	16
9:30	13	0	3	2	18
9:45	11	3	1	0	15
10:00	12	0	1	0	13
10:15	12	2	1	1	16
10:30	12	0	0	1	13
10:45	7	0	1	0	8
11:00	12	3	1	0	16
11:15	8	3	1	0	12
11:30	12	2	0	3	17
11:45	12	2	0	1	15

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	4	0	0	0	4
0:15	0	0	0	0	0
0:30	1	0	0	0	1
0:45	1	0	0	0	1
1:00	0	0	0	0	0
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	0	0	0	0	0
4:45	0	0	0	0	0
5:00	0	0	0	0	0
5:15	0	0	0	0	0
5:30	1	0	0	0	1
5:45	0	0	0	0	0
6:00	0	0	0	0	0
6:15	0	0	0	0	0
6:30	0	0	0	0	0
6:45	1	0	0	1	2
7:00	1	0	0	0	1
7:15	1	1	4	0	6
7:30	4	0	0	0	4
7:45	4	0	0	0	4
8:00	6	1	1	1	9
8:15	2	0	0	0	2
8:30	2	0	2	1	5
8:45	8	1	0	2	11
9:00	11	0	0	0	11
9:15	8	3	3	0	14
9:30	13	1	1	0	15
9:45	8	1	1	0	10
10:00	14	3	1	0	18
10:15	14	2	3	1	20
10:30	6	0	0	0	6
10:45	8	0	1	1	10
11:00	6	0	1	1	8
11:15	17	1	1	2	21
11:30	8	3	0	0	11
11:45	14	2	0	0	16

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/9/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	15	1	1	0	17
12:15	11	1	2	0	14
12:30	11	0	3	0	14
12:45	14	0	2	0	16
13:00	10	1	5	1	17
13:15	14	0	0	1	15
13:30	5	0	0	2	7
13:45	7	0	0	0	7
14:00	13	0	1	1	15
14:15	9	2	1	1	13
14:30	8	1	1	0	10
14:45	15	1	2	1	19
15:00	7	1	0	0	8
15:15	10	1	0	1	12
15:30	5	3	0	1	9
15:45	6	0	0	0	6
16:00	9	2	0	1	12
16:15	8	0	0	0	8
16:30	10	1	0	1	12
16:45	5	1	0	1	7
17:00	5	0	2	1	8
17:15	6	0	0	0	6
17:30	3	0	0	0	3
17:45	7	1	1	0	9
18:00	3	0	2	0	5
18:15	5	0	0	1	6
18:30	1	0	0	0	1
18:45	1	0	1	0	2
19:00	2	0	0	1	3
19:15	3	0	0	0	3
19:30	2	0	0	0	2
19:45	0	0	1	0	1
20:00	4	0	1	1	6
20:15	1	0	1	0	2
20:30	2	0	0	0	2
20:45	2	0	0	0	2
21:00	2	0	0	0	2
21:15	3	0	0	1	4
21:30	1	0	0	0	1
21:45	1	0	0	3	4
22:00	0	0	0	0	0
22:15	0	0	0	0	0
22:30	0	0	0	0	0
22:45	0	0	0	0	0
23:00	0	0	0	0	0
23:15	0	0	0	1	1
23:30	0	0	0	0	0
23:45	0	0	0	0	0
TOTAL	**523**	**35**	**49**	**35**	**642**

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	11	3	1	3	18
12:15	7	0	2	1	10
12:30	11	1	1	2	15
12:45	16	1	3	0	20
13:00	12	1	1	1	15
13:15	13	1	3	1	18
13:30	14	0	1	2	17
13:45	10	0	0	1	11
14:00	9	0	2	1	12
14:15	5	1	1	0	7
14:30	11	1	1	0	13
14:45	14	2	0	2	18
15:00	10	1	1	1	13
15:15	12	2	0	0	14
15:30	17	1	0	1	19
15:45	19	0	2	1	22
16:00	16	1	2	1	20
16:15	9	1	0	1	11
16:30	18	0	0	0	18
16:45	18	1	2	0	21
17:00	17	0	2	0	19
17:15	7	1	1	0	9
17:30	14	0	1	0	15
17:45	7	0	0	0	7
18:00	8	1	0	0	9
18:15	5	0	1	0	6
18:30	3	1	0	0	4
18:45	4	0	0	1	5
19:00	5	0	0	0	5
19:15	4	0	1	0	5
19:30	2	0	0	0	2
19:45	3	0	1	0	4
20:00	3	0	1	0	4
20:15	4	1	0	0	5
20:30	2	0	0	0	2
20:45	1	0	1	1	3
21:00	1	0	0	0	1
21:15	0	0	0	0	0
21:30	4	0	0	0	4
21:45	2	0	0	1	3
22:00	3	0	0	0	3
22:15	1	0	0	1	2
22:30	1	0	0	2	3
22:45	1	0	0	0	1
23:00	0	0	0	0	0
23:15	0	0	0	0	0
23:30	0	0	0	1	1
23:45	1	0	0	0	1
	518	**41**	**51**	**36**	**646**

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/8/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	0	0	0	0	0
0:15	0	0	0	0	0
0:30	0	0	0	0	0
0:45	0	0	0	0	0
1:00	0	0	0	0	0
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	0	0	0	0	0
4:45	0	0	0	0	0
5:00	0	0	0	0	0
5:15	0	0	0	0	0
5:30	0	0	0	0	0
5:45	0	0	0	0	0
6:00	0	0	0	0	0
6:15	0	0	0	0	0
6:30	0	0	0	0	0
6:45	0	0	0	0	0
7:00	0	0	0	0	0
7:15	0	0	0	0	0
7:30	0	0	0	0	0
7:45	0	0	0	0	0
8:00	0	0	0	0	0
8:15	0	0	0	0	0
8:30	0	0	0	0	0
8:45	0	0	0	0	0
9:00	0	0	0	0	0
9:15	0	0	0	0	0
9:30	0	0	0	0	0
9:45	0	0	0	0	0
10:00	0	0	0	0	0
10:15	0	0	0	0	0
10:30	0	0	0	0	0
10:45	0	0	0	0	0
11:00	0	0	0	0	0
11:15	0	0	0	0	0
11:30	0	0	0	0	0
11:45	0	0	0	0	0

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	0	0	0	0	0
0:15	0	0	0	0	0
0:30	0	0	0	0	0
0:45	0	0	0	0	0
1:00	0	0	0	0	0
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	0	0	0	0	0
4:45	0	0	0	0	0
5:00	0	0	0	0	0
5:15	0	0	0	0	0
5:30	0	0	0	0	0
5:45	0	0	0	0	0
6:00	0	0	0	0	0
6:15	0	0	0	0	0
6:30	0	0	0	0	0
6:45	0	0	0	0	0
7:00	0	0	0	0	0
7:15	0	0	0	0	0
7:30	0	0	0	0	0
7:45	0	0	0	0	0
8:00	0	0	0	0	0
8:15	0	0	0	0	0
8:30	0	0	0	0	0
8:45	0	0	0	0	0
9:00	0	0	0	0	0
9:15	0	0	0	0	0
9:30	0	0	0	0	0
9:45	0	0	0	0	0
10:00	0	0	0	0	0
10:15	0	0	0	0	0
10:30	0	0	0	0	0
10:45	0	0	0	0	0
11:00	0	0	0	0	0
11:15	0	0	0	0	0
11:30	0	0	0	0	0
11:45	0	0	0	0	0

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/8/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	0	0	0	0	0
12:15	0	0	0	0	0
12:30	0	0	0	0	0
12:45	0	0	0	0	0
13:00	0	0	0	0	0
13:15	0	0	0	0	0
13:30	0	0	0	0	0
13:45	0	0	0	0	0
14:00	0	0	0	0	0
14:15	0	0	0	0	0
14:30	0	0	0	0	0
14:45	0	0	0	0	0
15:00	0	0	0	0	0
15:15	0	0	0	0	0
15:30	0	0	0	0	0
15:45	0	0	0	0	0
16:00	0	0	0	0	0
16:15	0	0	0	0	0
16:30	0	0	0	0	0
16:45	0	0	0	0	0
17:00	0	0	0	0	0
17:15	0	0	0	0	0
17:30	0	0	0	0	0
17:45	0	0	0	0	0
18:00	0	0	0	0	0
18:15	0	0	0	0	0
18:30	0	0	0	0	0
18:45	0	0	0	0	0
19:00	0	0	0	0	0
19:15	0	0	0	0	0
19:30	0	0	0	0	0
19:45	0	0	0	0	0
20:00	0	0	0	0	0
20:15	0	0	0	0	0
20:30	0	0	0	0	0
20:45	0	0	0	0	0
21:00	0	0	0	0	0
21:15	0	0	0	0	0
21:30	0	0	0	0	0
21:45	0	0	0	0	0
22:00	0	0	0	0	0
22:15	0	0	0	0	0
22:30	0	0	0	0	0
22:45	0	0	0	0	0
23:00	0	0	0	0	0
23:15	0	0	0	0	0
23:30	0	0	0	0	0
23:45	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	0	0	0	0	0
12:15	0	0	0	0	0
12:30	0	0	0	0	0
12:45	0	0	0	0	0
13:00	0	0	0	0	0
13:15	0	0	0	0	0
13:30	0	0	0	0	0
13:45	0	0	0	0	0
14:00	0	0	0	0	0
14:15	0	0	0	0	0
14:30	0	0	0	0	0
14:45	0	0	0	0	0
15:00	0	0	0	0	0
15:15	0	0	0	0	0
15:30	0	0	0	0	0
15:45	0	0	0	0	0
16:00	0	0	0	0	0
16:15	0	0	0	0	0
16:30	0	0	0	0	0
16:45	0	0	0	0	0
17:00	0	0	0	0	0
17:15	0	0	0	0	0
17:30	0	0	0	0	0
17:45	0	0	0	0	0
18:00	0	0	0	0	0
18:15	0	0	0	0	0
18:30	0	0	0	0	0
18:45	0	0	0	0	0
19:00	0	0	0	0	0
19:15	0	0	0	0	0
19:30	0	0	0	0	0
19:45	0	0	0	0	0
20:00	0	0	0	0	0
20:15	0	0	0	0	0
20:30	0	0	0	0	0
20:45	0	0	0	0	0
21:00	0	0	0	0	0
21:15	0	0	0	0	0
21:30	0	0	0	0	0
21:45	0	0	0	0	0
22:00	0	0	0	0	0
22:15	0	0	0	0	0
22:30	0	0	0	0	0
22:45	0	0	0	0	0
23:00	0	0	0	0	0
23:15	0	0	0	0	0
23:30	0	0	0	0	0
23:45	0	0	0	0	0
	0	**0**	**0**	**0**	**0**

Appendix G
VMT Screening

URBAN CROSSROADS

urbanxroads.com

June 28, 2021

Ms. Cheryl Tubbs
Lilburn Corporation
1905 Business Center Drive
San Bernardino, CA 92408

SUBJECT: 776 W. MILL STREET VEHICLE MILES TRAVELED (VMT) SCREENING EVALUATION

Dear Ms. Cheryl Tubbs:

The following VMT Screening Analysis has been prepared for the proposed 776 W. Mill Street (**Project**), which is located at 776 W. Mill Street in the City of San Bernardino.

PROJECT OVERVIEW

The proposed Project is to allow the construction and operation of a truck sales, service/repair, and parts sales dealership on a 7.08-acre site located in the City of San Bernardino (APN's 0136-151-06, 09, 11, 19 & 0136-142-02). The Project includes the construction and operation of a 5,950 square foot building. Proposed parking includes 7 employee (passenger car) parking spaces, 21 truck parking spaces (11.5-feet x 30-feet), and 168 trailer parking spaces (11.5-feet x 55-feet) for a total of 196 spaces.

BACKGROUND

Changes to California Environmental Quality Act (CEQA) Guidelines were adopted in December 2018, which require all lead agencies to adopt VMT as a replacement for automobile delay-based level of service (LOS) as the new measure for identifying transportation impacts for land use projects. This statewide mandate went into effect July 1, 2020.

It is our understanding that the City of San Bernardino utilizes the San Bernardino County Transportation Authority (SBCTA) VMT Screening Tool (**Screening Tool**). The Screening Tool allows users to input an assessor's parcel number (APN) to determine if a project's location meets one or more of the screening thresholds for land use projects as identified in San Bernardino County Transportation Authority (SBCTA) Recommended Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment (**SBCTA Guidelines**) that addresses both traditional automobile delay-based level of service (LOS) and new VMT analysis requirements. (1) The City of San Bernardino then used the SBCTA Guidelines to develop its City of San Bernardino Traffic Impact Analysis Guidelines (August 2020) (**City Guidelines**). (2) These guidelines have been used to conduct this screening analysis.

PROJECT SCREENING

The City Guidelines provides details on appropriate screening thresholds that can be used to identify when a proposed land use project is anticipated to result in a less than significant impact without conducting a more detailed project level analysis. Screening thresholds are broken into the following three steps:

- Step 1: Transit Priority Area (TPA) Screening
- Step 2: Low VMT Area Screening
- Step 3: Project Type Screening

A land use project need only to meet one of the above screening thresholds to result in a less than significant impact.

STEP 1: TPA SCREENING

As described in the City Guidelines, projects located within a Transit Priority Area (TPA) (i.e., within ½ mile of an existing "major transit stop"[1] or an existing stop along a "high-quality transit corridor"[2]) may be presumed to have a less than significant impact absent substantial evidence to the contrary. However, the presumption may not be appropriate if a project:

- Has a Floor Area Ratio (FAR) of less than 0.75;
- Includes more parking for use by residents, customers, or employees of the project than required by the jurisdiction (if the jurisdiction requires the project to supply parking);
- Is inconsistent with the applicable Sustainable Communities Strategy (as determined by the lead agency, with input from the Metropolitan Planning Organization); or
- Replaces affordable residential units with a smaller number of moderate- or high-income residential units.

Based on screening tool results, the Project is located within ½ mile of an existing major transit stop, or along a high-quality transit corridor. However, the Project as designed does not meet the aforementioned secondary criteria. (See Attachment A)

The TPA screening threshold is not met.

STEP 2: LOW VMT AREA SCREENING

The City Guidelines states that "residential and office projects located within a low VMT-generating area may be presumed to have a less than significant impact absent substantial evidence to the contrary. In

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[1] Pub. Resources Code, § 21064.3 ("'Major transit stop' means a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.").

[2] Pub. Resources Code, § 21155 ("For purposes of this section, a high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.").

addition, other employment-related and mixed-use land use projects may qualify for the use of screening if the project can reasonably be expected to generate VMT per resident, per worker or per service population that is similar to the existing land uses in the low VMT area." The Screening Tool uses the sub-regional San Bernardino Transportation Analysis Model (SBTAM) to measure VMT performance within individual traffic analysis zones (TAZ's) within the SBCTA region. The Project's physical location based on the APN is input into the Screening Tool to determine VMT generated by the existing TAZ as compared to the City's impact threshold of "The baseline project-generated VMT per service population exceeds the City of San Bernardino General Plan Buildout VMT per service population"[3]. The parcel containing the proposed Project was selected and the Screening Tool was run for the Origin/Destination VMT per service population measure of VMT. Based on the Screening Tool results (see Attachment A), the Project is not located within a low VMT generating zone.

The Low VMT Area screening threshold is not met.

STEP 3: PROJECT TYPE SCREENING

The City Guidelines identifies that local serving retail projects less than 50,000 square feet may be presumed to have a less than significant impact absent substantial evidence to the contrary. In addition to local serving retail, other types of local serving uses such as community institutions (public libraries, fire stations, local government, etc.) may also be presumed to have a less than significant impact as their uses are local serving in nature and would tend to shorten vehicle trips.

Additionally, the City Guidelines identify that small projects anticipated to generate low traffic volumes (i.e., fewer than 110 daily trips) are presumed to have a less than significant impact absent substantial evidence to the contrary. Due to the unique nature of the proposed Project, the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition, 2017) (3) does not appear to be the best source for calculating the Project's trip generation. As such, trip generation estimates for the proposed Project have been developed using traffic count data collected at 14400 Randall Avenue, Fontana CA over two consecutive days on June 8th and June 9th, 2021. The proposed Project is intended to support the operations already occurring at 14400 Randall Avenue site, so it was chosen for survey to provide a close approximation of anticipated future activity. Site survey data is included in Attachment B. Attachment C includes a summary of the vehicle counts collected and trip generation rates and resulting trip generation estimate based on the surveyed data. The proposed Project is anticipated to generate 50 vehicle trip-ends per day, below the 110 daily vehicle trips.

Project Type screening threshold is met.

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[3] City Guidelines; page 28

CONCLUSION

Based on our review of applicable VMT screening thresholds, the proposed Project meets the Project Type screening and would therefore be assumed to result in a less than significant VMT impact; no additional VMT analysis is required.

If you have any questions, please contact me directly at 949-660-1994.

Respectfully submitted,

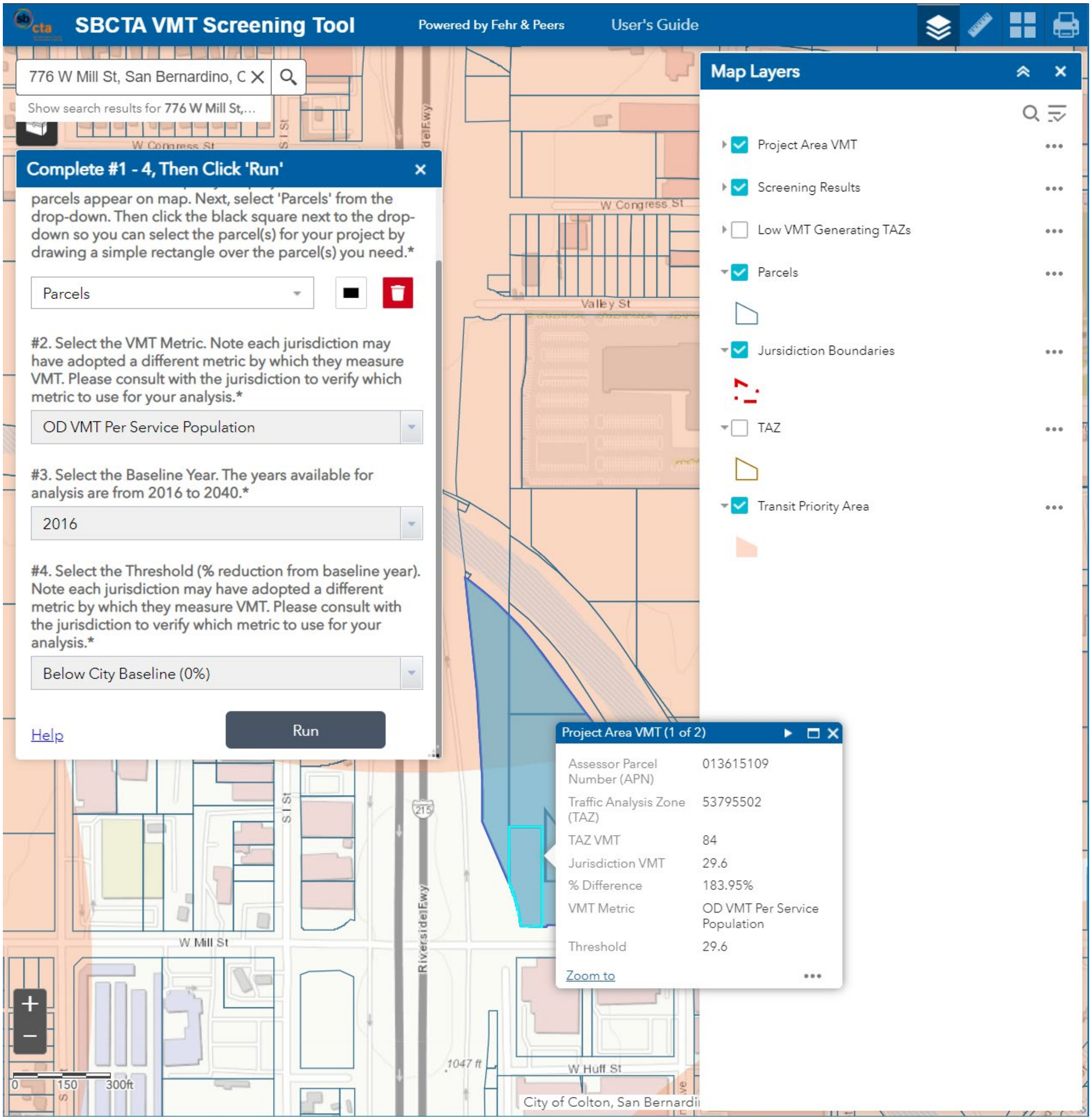
URBAN CROSSROADS, INC.

Alexander So
Senior Analyst

REFERENCES

1. **San Bernardino County Transportation Authority (SBCTA).** *Recommended Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment.* February 2020.
2. **City of San Bernardino.** *Traffic Impact Analysis Guidelines .* City of San Bernardino : s.n., August 2020.
3. **Institute of Transportation Engineers.** *Trip Generation Manual.* 10th Edition. 2017.

ATTACHMENT A:
SBCTA SCREENING TOOL RESULTS



776 W Mill St, San Bernardino, C

Show search results for 776 W Mill St,...

Complete #1 - 4, Then Click 'Run'

parcels appear on map. Next, select 'Parcels' from the drop-down. Then click the black square next to the drop-down so you can select the parcel(s) for your project by drawing a simple rectangle over the parcel(s) you need.*

Parcels

#2. Select the VMT Metric. Note each jurisdiction may have adopted a different metric by which they measure VMT. Please consult with the jurisdiction to verify which metric to use for your analysis.*

OD VMT Per Service Population

#3. Select the Baseline Year. The years available for analysis are from 2016 to 2040.*

2016

#4. Select the Threshold (% reduction from baseline year). Note each jurisdiction may have adopted a different metric by which they measure VMT. Please consult with the jurisdiction to verify which metric to use for your analysis.*

Below City Baseline (0%)

Help

Run

Map Layers

- ☑ Project Area VMT
- ☑ Screening Results
- ☐ Low VMT Generating TAZs
- ☑ Parcels
- ☑ Jursidiction Boundaries
- ☐ TAZ
- ☑ Transit Priority Area

Project Area VMT (1 of 2)

Assessor Parcel Number (APN)	013615109
Traffic Analysis Zone (TAZ)	53795502
TAZ VMT	84
Jurisdiction VMT	29.6
% Difference	183.95%
VMT Metric	OD VMT Per Service Population
Threshold	29.6

Zoom to

ATTACHMENT B:
DRIVEWAY COUNT DATA – JUNE 8TH & 9TH, 2021

TABLE 1: SUMMARY OF EXISTING COUNT DATA AT 14400 RANDALL AVENUE, FONTANA, CA

	AM Peak Hour			PM Peak Hour			
Land Use	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**Daily**
Day 1: June 8, 2021							
Passenger Cars:	45	17	62	35	64	99	1,069
2-axle Trucks:	1	2	3	4	1	5	85
3-axle Trucks:	11	8	19	5	6	11	134
4+-axle Trucks:	4	1	5	1	4	5	79
Total Truck Trips:	16	11	27	10	11	21	298
Total Trips[1]	61	28	89	45	75	120	1,367
Day 2: June 9, 2021							
Passenger Cars:	45	18	63	32	61	93	1,041
2-axle Trucks:	1	2	3	4	3	7	76
3-axle Trucks:	4	3	7	0	4	4	100
4+-axle Trucks:	1	4	5	3	2	5	71
Total Truck Trips:	6	9	15	7	9	16	247
Total Trips[1]	51	27	78	39	70	109	1,288
2-Day Average Trip Generation:							
Passenger Cars:	45	18	63	34	63	96	1,055
2-axle Trucks:	1	2	3	4	2	6	81
3-axle Trucks:	8	6	13	3	5	8	117
4+-axle Trucks:	3	3	5	2	3	5	75
Total Truck Trips:	11	10	21	9	10	19	273
Total Trips[1]	**56**	**28**	**84**	**42**	**73**	**115**	**1,328**

* Note: data collected on June 8 and 9, 2021.

[1] Total Trips = Passenger Cars + Total Truck Trips.

[2] Trip generation represents the sum of all driveways, by day.

Counts unlimited

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/8/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	0	0	0	0	0
0:15	0	0	0	0	0
0:30	0	0	0	0	0
0:45	0	0	0	0	0
1:00	0	0	0	0	0
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	1	0	0	0	1
4:45	0	0	0	0	0
5:00	0	0	0	0	0
5:15	1	0	0	0	1
5:30	0	0	0	0	0
5:45	2	0	0	0	2
6:00	4	0	0	0	4
6:15	2	0	0	0	2
6:30	10	0	2	2	14
6:45	21	0	0	0	21
7:00	18	0	1	0	19
7:15	6	1	0	0	7
7:30	12	1	0	1	14
7:45	10	0	0	1	11
8:00	16	0	6	1	23
8:15	11	1	2	1	15
8:30	8	0	3	1	12
8:45	7	1	1	1	10
9:00	10	1	1	1	13
9:15	11	2	4	0	17
9:30	10	0	1	0	11
9:45	8	2	2	1	13
10:00	9	1	1	1	12
10:15	9	1	0	0	10
10:30	10	2	2	0	14
10:45	9	0	0	4	13
11:00	14	1	0	1	16
11:15	22	2	2	0	26
11:30	13	1	1	0	15
11:45	10	1	1	1	13

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	4	0	0	0	4
0:15	1	0	0	0	1
0:30	1	0	0	0	1
0:45	0	0	0	0	0
1:00	0	0	0	0	0
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	0	0	0	0	0
4:45	0	0	0	0	0
5:00	0	0	0	0	0
5:15	0	0	0	0	0
5:30	1	0	0	0	1
5:45	0	0	0	0	0
6:00	0	0	0	0	0
6:15	0	0	0	0	0
6:30	0	0	1	0	1
6:45	0	0	0	0	0
7:00	6	1	1	1	9
7:15	2	1	0	0	3
7:30	4	0	0	1	5
7:45	4	0	0	0	4
8:00	6	1	2	0	9
8:15	3	1	2	0	6
8:30	4	0	4	1	9
8:45	3	1	0	0	4
9:00	14	1	2	1	18
9:15	7	1	1	0	9
9:30	12	0	2	2	16
9:45	9	0	2	0	11
10:00	6	1	2	1	10
10:15	8	1	1	0	10
10:30	7	1	3	0	11
10:45	10	2	0	2	14
11:00	13	1	0	2	16
11:15	12	0	0	2	14
11:30	10	0	1	2	13
11:45	13	1	0	0	14

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/8/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	17	3	2	2	24
12:15	10	1	1	1	13
12:30	12	2	0	0	14
12:45	11	2	1	0	14
13:00	10	1	0	4	15
13:15	15	1	1	1	18
13:30	14	1	0	1	16
13:45	8	0	1	2	11
14:00	7	0	4	0	11
14:15	10	1	0	0	11
14:30	8	0	1	0	9
14:45	11	1	1	1	14
15:00	8	1	0	0	9
15:15	8	3	2	1	14
15:30	10	1	3	2	16
15:45	5	1	2	1	9
16:00	13	1	3	1	18
16:15	7	0	2	0	9
16:30	3	2	0	0	5
16:45	12	1	0	0	13
17:00	6	0	1	0	7
17:15	4	0	1	0	5
17:30	8	0	1	0	9
17:45	4	2	0	0	6
18:00	4	0	0	0	4
18:15	3	1	3	0	7
18:30	2	0	1	1	4
18:45	6	0	0	0	6
19:00	3	0	1	1	5
19:15	4	0	0	0	4
19:30	3	0	2	1	6
19:45	3	0	0	0	3
20:00	4	0	0	0	4
20:15	1	0	1	1	3
20:30	4	0	0	0	4
20:45	1	0	0	1	2
21:00	1	0	0	0	1
21:15	0	0	1	0	1
21:30	0	0	0	0	0
21:45	1	0	0	0	1
22:00	1	0	0	0	1
22:15	1	0	0	0	1
22:30	1	0	0	0	1
22:45	0	0	0	0	0
23:00	0	0	0	0	0
23:15	0	0	0	0	0
23:30	0	0	0	0	0
23:45	1	0	0	0	1
TOTAL	**529**	**44**	**66**	**39**	**678**

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	11	1	3	2	17
12:15	13	1	1	2	17
12:30	13	3	2	0	18
12:45	11	1	1	0	13
13:00	12	5	2	0	19
13:15	8	0	1	1	10
13:30	19	1	2	1	23
13:45	10	1	4	1	16
14:00	10	1	0	0	11
14:15	16	0	2	1	19
14:30	10	0	3	1	14
14:45	3	1	1	1	6
15:00	10	1	1	2	14
15:15	19	1	1	0	21
15:30	24	1	1	1	27
15:45	12	3	0	1	16
16:00	23	0	4	2	29
16:15	10	0	1	1	12
16:30	21	0	1	1	23
16:45	10	1	0	0	11
17:00	17	0	0	0	17
17:15	13	1	0	1	15
17:30	11	0	1	0	12
17:45	7	0	1	0	8
18:00	7	1	1	0	9
18:15	4	0	1	0	5
18:30	3	0	0	0	3
18:45	6	0	0	0	6
19:00	6	2	0	0	8
19:15	3	0	0	0	3
19:30	9	0	4	1	14
19:45	7	1	0	1	9
20:00	2	0	1	1	4
20:15	4	0	0	1	5
20:30	0	0	1	0	1
20:45	3	0	2	0	5
21:00	2	0	0	1	3
21:15	0	0	0	1	1
21:30	6	0	0	0	6
21:45	0	0	0	0	0
22:00	2	0	1	0	3
22:15	1	0	0	0	1
22:30	1	0	0	0	1
22:45	0	0	0	0	0
23:00	0	0	0	0	0
23:15	0	0	0	0	0
23:30	0	0	0	0	0
23:45	1	0	0	0	1
	540	**41**	**68**	**40**	**689**

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/8/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	0	0	0	0	0
0:15	0	0	0	0	0
0:30	0	0	0	0	0
0:45	0	0	0	0	0
1:00	0	0	0	0	0
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	0	0	0	0	0
4:45	0	0	0	0	0
5:00	0	0	0	0	0
5:15	0	0	0	0	0
5:30	0	0	0	0	0
5:45	0	0	0	0	0
6:00	0	0	0	0	0
6:15	0	0	0	0	0
6:30	0	0	0	0	0
6:45	0	0	0	0	0
7:00	0	0	0	0	0
7:15	0	0	0	0	0
7:30	0	0	0	0	0
7:45	0	0	0	0	0
8:00	0	0	0	0	0
8:15	0	0	0	0	0
8:30	0	0	0	0	0
8:45	0	0	0	0	0
9:00	0	0	0	0	0
9:15	0	0	0	0	0
9:30	0	0	0	0	0
9:45	0	0	0	0	0
10:00	0	0	0	0	0
10:15	0	0	0	0	0
10:30	0	0	0	0	0
10:45	0	0	0	0	0
11:00	0	0	0	0	0
11:15	0	0	0	0	0
11:30	0	0	0	0	0
11:45	0	0	0	0	0

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	0	0	0	0	0
0:15	0	0	0	0	0
0:30	0	0	0	0	0
0:45	0	0	0	0	0
1:00	0	0	0	0	0
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	0	0	0	0	0
4:45	0	0	0	0	0
5:00	0	0	0	0	0
5:15	0	0	0	0	0
5:30	0	0	0	0	0
5:45	0	0	0	0	0
6:00	0	0	0	0	0
6:15	0	0	0	0	0
6:30	0	0	0	0	0
6:45	0	0	0	0	0
7:00	0	0	0	0	0
7:15	0	0	0	0	0
7:30	0	0	0	0	0
7:45	0	0	0	0	0
8:00	0	0	0	0	0
8:15	0	0	0	0	0
8:30	0	0	0	0	0
8:45	0	0	0	0	0
9:00	0	0	0	0	0
9:15	0	0	0	0	0
9:30	0	0	0	0	0
9:45	0	0	0	0	0
10:00	0	0	0	0	0
10:15	0	0	0	0	0
10:30	0	0	0	0	0
10:45	0	0	0	0	0
11:00	0	0	0	0	0
11:15	0	0	0	0	0
11:30	0	0	0	0	0
11:45	0	0	0	0	0

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/8/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	0	0	0	0	0
12:15	0	0	0	0	0
12:30	0	0	0	0	0
12:45	0	0	0	0	0
13:00	0	0	0	0	0
13:15	0	0	0	0	0
13:30	0	0	0	0	0
13:45	0	0	0	0	0
14:00	0	0	0	0	0
14:15	0	0	0	0	0
14:30	0	0	0	0	0
14:45	0	0	0	0	0
15:00	0	0	0	0	0
15:15	0	0	0	0	0
15:30	0	0	0	0	0
15:45	0	0	0	0	0
16:00	0	0	0	0	0
16:15	0	0	0	0	0
16:30	0	0	0	0	0
16:45	0	0	0	0	0
17:00	0	0	0	0	0
17:15	0	0	0	0	0
17:30	0	0	0	0	0
17:45	0	0	0	0	0
18:00	0	0	0	0	0
18:15	0	0	0	0	0
18:30	0	0	0	0	0
18:45	0	0	0	0	0
19:00	0	0	0	0	0
19:15	0	0	0	0	0
19:30	0	0	0	0	0
19:45	0	0	0	0	0
20:00	0	0	0	0	0
20:15	0	0	0	0	0
20:30	0	0	0	0	0
20:45	0	0	0	0	0
21:00	0	0	0	0	0
21:15	0	0	0	0	0
21:30	0	0	0	0	0
21:45	0	0	0	0	0
22:00	0	0	0	0	0
22:15	0	0	0	0	0
22:30	0	0	0	0	0
22:45	0	0	0	0	0
23:00	0	0	0	0	0
23:15	0	0	0	0	0
23:30	0	0	0	0	0
23:45	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	0	0	0	0	0
12:15	0	0	0	0	0
12:30	0	0	0	0	0
12:45	0	0	0	0	0
13:00	0	0	0	0	0
13:15	0	0	0	0	0
13:30	0	0	0	0	0
13:45	0	0	0	0	0
14:00	0	0	0	0	0
14:15	0	0	0	0	0
14:30	0	0	0	0	0
14:45	0	0	0	0	0
15:00	0	0	0	0	0
15:15	0	0	0	0	0
15:30	0	0	0	0	0
15:45	0	0	0	0	0
16:00	0	0	0	0	0
16:15	0	0	0	0	0
16:30	0	0	0	0	0
16:45	0	0	0	0	0
17:00	0	0	0	0	0
17:15	0	0	0	0	0
17:30	0	0	0	0	0
17:45	0	0	0	0	0
18:00	0	0	0	0	0
18:15	0	0	0	0	0
18:30	0	0	0	0	0
18:45	0	0	0	0	0
19:00	0	0	0	0	0
19:15	0	0	0	0	0
19:30	0	0	0	0	0
19:45	0	0	0	0	0
20:00	0	0	0	0	0
20:15	0	0	0	0	0
20:30	0	0	0	0	0
20:45	0	0	0	0	0
21:00	0	0	0	0	0
21:15	0	0	0	0	0
21:30	0	0	0	0	0
21:45	0	0	0	0	0
22:00	0	0	0	0	0
22:15	0	0	0	0	0
22:30	0	0	0	0	0
22:45	0	0	0	0	0
23:00	0	0	0	0	0
23:15	0	0	0	0	0
23:30	0	0	0	0	0
23:45	0	0	0	0	0
	0	**0**	**0**	**0**	**0**

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/9/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	0	0	0	0	0
0:15	0	0	0	0	0
0:30	0	0	0	0	0
0:45	0	0	0	0	0
1:00	1	0	0	0	1
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	0	0	0	0	0
4:45	1	0	0	0	1
5:00	0	0	0	0	0
5:15	0	0	0	0	0
5:30	2	0	0	0	2
5:45	0	0	0	0	0
6:00	4	0	0	0	4
6:15	8	0	0	1	9
6:30	10	0	1	0	11
6:45	15	0	1	0	16
7:00	20	0	0	0	20
7:15	12	0	1	0	13
7:30	10	0	2	2	14
7:45	13	0	1	1	15
8:00	12	0	0	0	12
8:15	11	0	0	0	11
8:30	8	0	0	1	9
8:45	14	1	4	0	19
9:00	12	0	3	0	15
9:15	13	2	0	1	16
9:30	13	0	3	2	18
9:45	11	3	1	0	15
10:00	12	0	1	0	13
10:15	12	2	1	1	16
10:30	12	0	0	1	13
10:45	7	0	1	0	8
11:00	12	3	1	0	16
11:15	8	3	1	0	12
11:30	12	2	0	3	17
11:45	12	2	0	1	15

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	4	0	0	0	4
0:15	0	0	0	0	0
0:30	1	0	0	0	1
0:45	1	0	0	0	1
1:00	0	0	0	0	0
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	0	0	0	0	0
4:45	0	0	0	0	0
5:00	0	0	0	0	0
5:15	0	0	0	0	0
5:30	1	0	0	0	1
5:45	0	0	0	0	0
6:00	0	0	0	0	0
6:15	0	0	0	0	0
6:30	0	0	0	0	0
6:45	1	0	0	1	2
7:00	1	0	0	0	1
7:15	1	1	4	0	6
7:30	4	0	0	0	4
7:45	4	0	0	0	4
8:00	6	1	1	1	9
8:15	2	0	0	0	2
8:30	2	0	2	1	5
8:45	8	1	0	2	11
9:00	11	0	0	0	11
9:15	8	3	3	0	14
9:30	13	1	1	0	15
9:45	8	1	1	0	10
10:00	14	3	1	0	18
10:15	14	2	3	1	20
10:30	6	0	0	0	6
10:45	8	0	1	1	10
11:00	6	0	1	1	8
11:15	17	1	1	2	21
11:30	8	3	0	0	11
11:45	14	2	0	0	16

Counts unlimited

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/9/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	15	1	1	0	17
12:15	11	1	2	0	14
12:30	11	0	3	0	14
12:45	14	0	2	0	16
13:00	10	1	5	1	17
13:15	14	0	0	1	15
13:30	5	0	0	2	7
13:45	7	0	0	0	7
14:00	13	0	1	1	15
14:15	9	2	1	1	13
14:30	8	1	1	0	10
14:45	15	1	2	1	19
15:00	7	1	0	0	8
15:15	10	1	0	1	12
15:30	5	3	0	1	9
15:45	6	0	0	0	6
16:00	9	2	0	1	12
16:15	8	0	0	0	8
16:30	10	1	0	1	12
16:45	5	1	0	1	7
17:00	5	0	2	1	8
17:15	6	0	0	0	6
17:30	3	0	0	0	3
17:45	7	1	1	0	9
18:00	3	0	2	0	5
18:15	5	0	0	1	6
18:30	1	0	0	0	1
18:45	1	0	1	0	2
19:00	2	0	0	1	3
19:15	3	0	0	0	3
19:30	2	0	0	0	2
19:45	0	0	1	0	1
20:00	4	0	1	1	6
20:15	1	0	1	0	2
20:30	2	0	0	0	2
20:45	2	0	0	0	2
21:00	2	0	0	0	2
21:15	3	0	0	1	4
21:30	1	0	0	0	1
21:45	1	0	0	3	4
22:00	0	0	0	0	0
22:15	0	0	0	0	0
22:30	0	0	0	0	0
22:45	0	0	0	0	0
23:00	0	0	0	0	0
23:15	0	0	0	1	1
23:30	0	0	0	0	0
23:45	0	0	0	0	0
TOTAL	**523**	**35**	**49**	**35**	**642**

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	11	3	1	3	18
12:15	7	0	2	1	10
12:30	11	1	1	2	15
12:45	16	1	3	0	20
13:00	12	1	1	1	15
13:15	13	1	3	1	18
13:30	14	0	1	2	17
13:45	10	0	0	1	11
14:00	9	0	2	1	12
14:15	5	1	1	0	7
14:30	11	1	1	0	13
14:45	14	2	0	2	18
15:00	10	1	1	1	13
15:15	12	2	0	0	14
15:30	17	1	0	1	19
15:45	19	0	2	1	22
16:00	16	1	2	1	20
16:15	9	1	0	1	11
16:30	18	0	0	0	18
16:45	18	1	2	0	21
17:00	17	0	2	0	19
17:15	7	1	1	0	9
17:30	14	0	1	0	15
17:45	7	0	0	0	7
18:00	8	1	0	0	9
18:15	5	0	1	0	6
18:30	3	1	0	0	4
18:45	4	0	0	1	5
19:00	5	0	0	0	5
19:15	4	0	1	0	5
19:30	2	0	0	0	2
19:45	3	0	1	0	4
20:00	3	0	1	0	4
20:15	4	1	0	0	5
20:30	2	0	0	0	2
20:45	1	0	1	1	3
21:00	1	0	0	0	1
21:15	0	0	0	0	0
21:30	4	0	0	0	4
21:45	2	0	0	1	3
22:00	3	0	0	0	3
22:15	1	0	0	1	2
22:30	1	0	0	2	3
22:45	1	0	0	0	1
23:00	0	0	0	0	0
23:15	0	0	0	0	0
23:30	0	0	0	1	1
23:45	1	0	0	0	1
	518	**41**	**51**	**36**	**646**

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/8/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	0	0	0	0	0
0:15	0	0	0	0	0
0:30	0	0	0	0	0
0:45	0	0	0	0	0
1:00	0	0	0	0	0
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	0	0	0	0	0
4:45	0	0	0	0	0
5:00	0	0	0	0	0
5:15	0	0	0	0	0
5:30	0	0	0	0	0
5:45	0	0	0	0	0
6:00	0	0	0	0	0
6:15	0	0	0	0	0
6:30	0	0	0	0	0
6:45	0	0	0	0	0
7:00	0	0	0	0	0
7:15	0	0	0	0	0
7:30	0	0	0	0	0
7:45	0	0	0	0	0
8:00	0	0	0	0	0
8:15	0	0	0	0	0
8:30	0	0	0	0	0
8:45	0	0	0	0	0
9:00	0	0	0	0	0
9:15	0	0	0	0	0
9:30	0	0	0	0	0
9:45	0	0	0	0	0
10:00	0	0	0	0	0
10:15	0	0	0	0	0
10:30	0	0	0	0	0
10:45	0	0	0	0	0
11:00	0	0	0	0	0
11:15	0	0	0	0	0
11:30	0	0	0	0	0
11:45	0	0	0	0	0

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
0:00	0	0	0	0	0
0:15	0	0	0	0	0
0:30	0	0	0	0	0
0:45	0	0	0	0	0
1:00	0	0	0	0	0
1:15	0	0	0	0	0
1:30	0	0	0	0	0
1:45	0	0	0	0	0
2:00	0	0	0	0	0
2:15	0	0	0	0	0
2:30	0	0	0	0	0
2:45	0	0	0	0	0
3:00	0	0	0	0	0
3:15	0	0	0	0	0
3:30	0	0	0	0	0
3:45	0	0	0	0	0
4:00	0	0	0	0	0
4:15	0	0	0	0	0
4:30	0	0	0	0	0
4:45	0	0	0	0	0
5:00	0	0	0	0	0
5:15	0	0	0	0	0
5:30	0	0	0	0	0
5:45	0	0	0	0	0
6:00	0	0	0	0	0
6:15	0	0	0	0	0
6:30	0	0	0	0	0
6:45	0	0	0	0	0
7:00	0	0	0	0	0
7:15	0	0	0	0	0
7:30	0	0	0	0	0
7:45	0	0	0	0	0
8:00	0	0	0	0	0
8:15	0	0	0	0	0
8:30	0	0	0	0	0
8:45	0	0	0	0	0
9:00	0	0	0	0	0
9:15	0	0	0	0	0
9:30	0	0	0	0	0
9:45	0	0	0	0	0
10:00	0	0	0	0	0
10:15	0	0	0	0	0
10:30	0	0	0	0	0
10:45	0	0	0	0	0
11:00	0	0	0	0	0
11:15	0	0	0	0	0
11:30	0	0	0	0	0
11:45	0	0	0	0	0

City: County of San Bernardino
Location: Randall - West Driveway
Date: 6/8/2021
Count Type: Classified Driveway Count

	Entering				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	0	0	0	0	0
12:15	0	0	0	0	0
12:30	0	0	0	0	0
12:45	0	0	0	0	0
13:00	0	0	0	0	0
13:15	0	0	0	0	0
13:30	0	0	0	0	0
13:45	0	0	0	0	0
14:00	0	0	0	0	0
14:15	0	0	0	0	0
14:30	0	0	0	0	0
14:45	0	0	0	0	0
15:00	0	0	0	0	0
15:15	0	0	0	0	0
15:30	0	0	0	0	0
15:45	0	0	0	0	0
16:00	0	0	0	0	0
16:15	0	0	0	0	0
16:30	0	0	0	0	0
16:45	0	0	0	0	0
17:00	0	0	0	0	0
17:15	0	0	0	0	0
17:30	0	0	0	0	0
17:45	0	0	0	0	0
18:00	0	0	0	0	0
18:15	0	0	0	0	0
18:30	0	0	0	0	0
18:45	0	0	0	0	0
19:00	0	0	0	0	0
19:15	0	0	0	0	0
19:30	0	0	0	0	0
19:45	0	0	0	0	0
20:00	0	0	0	0	0
20:15	0	0	0	0	0
20:30	0	0	0	0	0
20:45	0	0	0	0	0
21:00	0	0	0	0	0
21:15	0	0	0	0	0
21:30	0	0	0	0	0
21:45	0	0	0	0	0
22:00	0	0	0	0	0
22:15	0	0	0	0	0
22:30	0	0	0	0	0
22:45	0	0	0	0	0
23:00	0	0	0	0	0
23:15	0	0	0	0	0
23:30	0	0	0	0	0
23:45	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**

	Exiting				
	Pass Veh	Large 2 Axle	3 Axle	4+ Axle	Total
12:00	0	0	0	0	0
12:15	0	0	0	0	0
12:30	0	0	0	0	0
12:45	0	0	0	0	0
13:00	0	0	0	0	0
13:15	0	0	0	0	0
13:30	0	0	0	0	0
13:45	0	0	0	0	0
14:00	0	0	0	0	0
14:15	0	0	0	0	0
14:30	0	0	0	0	0
14:45	0	0	0	0	0
15:00	0	0	0	0	0
15:15	0	0	0	0	0
15:30	0	0	0	0	0
15:45	0	0	0	0	0
16:00	0	0	0	0	0
16:15	0	0	0	0	0
16:30	0	0	0	0	0
16:45	0	0	0	0	0
17:00	0	0	0	0	0
17:15	0	0	0	0	0
17:30	0	0	0	0	0
17:45	0	0	0	0	0
18:00	0	0	0	0	0
18:15	0	0	0	0	0
18:30	0	0	0	0	0
18:45	0	0	0	0	0
19:00	0	0	0	0	0
19:15	0	0	0	0	0
19:30	0	0	0	0	0
19:45	0	0	0	0	0
20:00	0	0	0	0	0
20:15	0	0	0	0	0
20:30	0	0	0	0	0
20:45	0	0	0	0	0
21:00	0	0	0	0	0
21:15	0	0	0	0	0
21:30	0	0	0	0	0
21:45	0	0	0	0	0
22:00	0	0	0	0	0
22:15	0	0	0	0	0
22:30	0	0	0	0	0
22:45	0	0	0	0	0
23:00	0	0	0	0	0
23:15	0	0	0	0	0
23:30	0	0	0	0	0
23:45	0	0	0	0	0
	0	**0**	**0**	**0**	**0**

ATTACHMENT C:
PROJECT TRIP GENERATION

TABLE 1: EMPIRICAL DATA FOR EXISTING FACILITY

Land Use[1]	Units[2]	AM Peak Hour			PM Peak Hour			Daily
		In	Out	Total	In	Out	Total	
Actual Vehicle Trip Generation Rates								
TEC Equipment[3]	TSF							
Passenger Cars		0.266	0.103	0.369	0.198	0.369	0.567	6.233
2-Axle Trucks		0.006	0.012	0.018	0.024	0.012	0.035	0.476
3-Axle Trucks		0.044	0.032	0.077	0.015	0.030	0.044	0.691
4+-Axle Trucks		0.015	0.015	0.030	0.012	0.018	0.030	0.443
Passenger Car Equivalent (PCE) Trip Generation Rates[4]								
TEC Equipment[3]	TSF							
Passenger Cars		0.266	0.103	0.369	0.198	0.369	0.567	6.233
2-Axle Trucks (PCE = 2.0)		0.012	0.024	0.035	0.047	0.024	0.071	0.951
3-Axle Trucks (PCE = 2.5)		0.111	0.081	0.192	0.037	0.074	0.111	1.728
4+-Axle Trucks (PCE = 3.0)		0.044	0.044	0.089	0.035	0.053	0.089	1.329

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Tenth Edition (2017).

[2] TSF = thousand square feet

[3] Trip generation rates based on empirical data (see Attachment B).

[4] PCE factors per City Guidelines: 2-axle = 2.0; 3-axle = 2.5; 4+-axle = 3.0.

TABLE 2: PROJECT TRIP GENERATION SUMMARY

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Actual Vehicles:									
776 W. Mill Street	5.950	TSF							
Passenger Cars:			2	1	3	1	2	3	38
2-axle Trucks:			0	0	0	0	0	0	4
3-axle Trucks:			0	0	0	0	0	0	4
4+-axle Trucks:			0	0	0	0	0	0	4
Total Truck Trips (Actual Vehicles):			0	0	0	0	0	0	12
Total Trips (Actual Vehicles)[2]			**2**	**1**	**3**	**1**	**2**	**3**	**50**

[1] TSF = thousand square feet

[2] Total Trips = Passenger Cars + Truck Trips.

Appendix H
Mitigation Monitoring and Reporting Program (MMRP)

MITIGATION MONITORING REPORTING PROGRAM

Project: TEC Equipment 776 W Mill Street **Applicant:** TEC Equipment, Inc.

Lead Agency: City of San Bernardino **Date:** December 2021

Mitigation Measures No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date /Initials
Section 4-Biological Resources					
BIO-1: If construction occurs between February 1st and August 31st, a pre-construction clearance survey for nesting birds should be conducted within three (3) days of the start of any vegetation removal or ground disturbing activities to ensure that no nesting birds will be disturbed during construction. The biologist conducting the clearance survey should document a negative survey with a brief letter report indicating that no impacts to active avian nests will occur. If an active avian nest is discovered during the pre-construction clearance survey, construction activities should stay outside of a no-disturbance buffer. The size of the no-disturbance buffer will be determined by the wildlife biologist and will depend on the level of noise and/or surrounding anthropogenic disturbances, line of sight between the nest and the construction activity, type and duration of construction activity, ambient noise, species habituation, and topographical barriers. These factors will be evaluated on a case-by-case basis when developing buffer distances. Limits of construction to avoid an active nest will be established in the field with flagging, fencing, or other appropriate barriers; and construction personnel will be instructed on the sensitivity of nest areas. A biological monitor should be present to delineate the boundaries of the buffer area and to monitor the active nest to ensure that nesting behavior is not adversely affected by the	City of San Bernardino, City Planner or designee	Pre-construction if construction during nesting season	No more than three (3) days prior to construction, ground disturbance or vegetation removal during the nesting bird season (February through August)	On-site inspection, submittal of survey report.	

Mitigation Measures No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date /Initials
construction activity. Once the young have fledged and left the nest, or the nest otherwise becomes inactive under natural conditions, construction activities within the buffer area can occur.					
Section 5-Cultural Resources					
CR-1: Monitor(s) Shall Be Present During Grading/Excavation/Trenching. The archaeological monitor shall be present full-time during all soil-disturbing and grading/ excavation/trenching activities that could result in impacts to archaeological resources. The principal investigator (PI) may submit a detailed letter to the lead agency during construction requesting a modification to the monitoring program when a field condition such as modern disturbance post-dating previous grading/trenching activities, presence of fossil formations, or native soils is encountered that may reduce or increase the potential for resources to be present.	Archaeological Monitor	During construction	Throughout construction	On-site inspection	
CR-2: Discovery Notification Process. In the event of an archaeological discovery, either historic or prehistoric, the archaeological monitor shall direct the contractor to temporarily divert all soil-disturbing activities, including but not limited to, digging, trenching, excavating, or grading activities in the area of discovery and in the area reasonably suspected to overlay adjacent resources, and immediately notify the Native American monitor and client, as appropriate. The monitor shall immediately notify the PI (unless monitor is the PI) of the discovery.	Archaeological Monitor	During construction	Upon archaeological discovery	On-site inspection, separate submittal (Reports/Studies/ Plans)	

Mitigation Measures No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date /Initials
CR-3: Determination of Significance. The PI shall evaluate the significance of the resource. The PI shall immediately notify the City to discuss significance determination and shall also submit a letter indicating whether additional mitigation is required. If the resource is significant, the PI shall submit an Archaeological Data Recovery Program (ADRP) that has also been reviewed by the Native American consultant/monitor, and obtain written approval from the City to implement that program. Impacts to significant resources must be mitigated before ground disturbing activities in the area of discovery will be allowed to resume. If the resource is not significant, the PI shall submit a letter to the City indicating that artifacts will be collected, curated, and documented in the final monitoring report. The letter shall also indicate that no further work is required.	Principal Investigator	Upon archaeological discovery	Discussion with the City	Discussion with the City and Review by Native American consultant	
CR-4: Discovery of Human Remains. If human remains are discovered, work shall halt in that area until a determination can be made regarding the provenance of the human remains, and the following procedures as set forth in CEQA Section 15064.5(e), the California Public Resources Code (Sec. 5097.98), and the State Health and Safety Code (Sec. 7050.5) shall be undertaken: The archaeological monitor shall notify the PI, if the monitor is not qualified as a PI. The PI shall notify the medical examiner after consultation with the City, either in person or via telephone. Work shall be directed away from the location of the discovery and any nearby area reasonably suspected to overlay adjacent human remains until a determination can be made by the medical examiner in consultation with the PI concerning the provenance of the remains. The medical	City of San Bernardino, City Planner or designee, County Coroner	During construction	In event human remains are found	On-site inspection	

Mitigation Measures No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date /Initials
examiner, in consultation with the PI, will determine the need for a field examination to determine the provenance. If a field examination is not warranted, the medical examiner will determine, with input from the PI, if the remains are or are most likely to be of Native American origin. If human remains ARE determined to be Native American: The medical examiner will notify the NAHC within 24 hours. By law, ONLY the medical examiner can make this call OR the NAHC will immediately identify the person or persons determined to be the Most Likely Descendent (MLD) and provide contact information. The MLD will contact the PI within 24 hours or sooner after the medical examiner has completed coordination to begin the consultation process in accordance with CEQA Section 15064.5(e), the California Public Resources, and the State Health and Safety Code. The MLD will have 48 hours to make recommendations to the property owner or representative for the treatment or disposition with proper dignity of the human remains and associated grave goods. Disposition of Native American human remains will be determined between the MLD and the PI, and, if: a) The NAHC is unable to identify the MLD, or the MLD failed to make a recommendation within 48 hours after being notified by the NAHC; or b) The landowner or authorized representative rejects the recommendation of the MLD and mediation in accordance with Public Resources Code 5097.94 (k) by the NAHC fails to provide measures acceptable to the landowner; then c) Upon the discovery of multiple Native American human remains during a ground-disturbing land development activity, the landowner may agree that additional conferral with descendants is					

Mitigation Measures No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date /Initials
necessary to consider culturally appropriate treatment of multiple Native American human remains. Culturally appropriate treatment of such a discovery may be ascertained from review of the site utilizing cultural and archaeological standards. Where the parties are unable to agree upon the appropriate treatment measures, the human remains and grave goods buried with the Native American human remains shall be reinterred with appropriate dignity.					
Section 7: Geology and Soils					
GEO-1: Prior to the issuance of grading permits, the Applicant shall submit to and receive approval from the City a Final Geotechnical Report with recommendations for appropriate site preparation to prevent any substantial adverse effects from on-site geotechnical conditions. The City Engineer shall inspect the work to ensure compliance.	City Engineer	Prior to issuance of grading permits	Throughout construction	On-site inspection	
GEO-2: Paleontological Resources. Any deep excavations (usually over 5 feet in depth) in the proposed Project area must be monitored by a qualified paleontologist. In the event of an inadvertent discovery, the following measures shall apply: If fossils are found during earthwork activities, all earthmoving actives within a 100-feet shall stop, the City and a qualified vertebrate paleontologist must be contacted. The vertebrate paleontologist shall examine the remains and determine the next appropriate action based on his or her findings. All monitoring shall conform to the standards and protocols of the San Bernardino County Museum and approved by the Lead Agency. If the fossil discovery is deemed	City of San Bernardino, City Planner or designee	During excavations	Throughout excavations over 5 feet	On-site inspection	

Mitigation Measures No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date /Initials
significant, and upon recommendation of the paleontologist and approval by the City, the fossils shall be quickly and professionally recovered using appropriate recovery techniques based on the type, size, and mode of preservation of the unearthed fossils. Earthwork may resume in the area of the fossil discovery once the fossil has been recovered, and the qualified paleontologist deems the site has been mitigated to the extent necessary. Additional earthwork following the fossil discovery may continue to be monitored for paleontological resources on an as-needed basis, at the discretion of the qualified paleontologist. Recovered fossils shall be prepared, identified, cataloged, and stored in a recognized professional repository along with associated field notes, photographs, and compiled fossil locality data. For projects in San Bernardino County the recommended designated repository is the San Bernardino County Museum. A final summary report shall be completed that outlines the results of the mitigation program. This report shall include discussions of the methods used, stratigraphic section(s) exposed, fossils collected, and significance of recovered fossils. This report shall be submitted to the City of San Bernardino, and designated repository.					
Section 9: Hazards and Hazardous Materials					
HAZ-1: Prior to construction, the Project Proponent shall prepare and submit to the City a Hazardous Spill Prevention Plan to minimize the likelihood of a spill. The plan shall state the actions that would be required if a spill occurs to prevent contamination of surface waters and provide for cleanup of the spill. The plan shall	City of San Bernardino, City Planner or designee	Prior to Construction	Prior to Certificate of Occupancy	City approval of Hazardous Spill Prevention Plan	

Mitigation Measures No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date /Initials
follow federal, State, and local safety guidelines and standards to avoid increased exposure to these pollutants.					
Section 10: Hydrology and Water Quality					
WQ-1: The Project Proponent shall implement all Non-Structural Source Control Best Management Practices (BMPs) and Structural Source BMPs as listed in the final WQMP as approved by the City.	City of San Bernardino, City Planner or designee	Prior to Construction	Prior to Certificate of Occupancy	Plan check, on-site inspection	