Initial Study and Mitigated Negative Declaration

Mission Canyon II Pump Station and Pipeline Project

Prepared by:

Eastern Municipal Water District
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March 2024

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Acronyms

Acronym	Definition
Basin Plan	Santa Ana River Basin Water Quality Control Plan
BMP	best management practice
CalARP	California Accidental Release Prevention
CAP	Climate Action Plan
CARB	California Air Resources Board
CDOC	California Department of Conservation
Caltrans	California Department of Transportation
CAL FIRE	California Department of Forestry and Fire Protection
CEQA	California Environmental Quality Act
CGS	California Geological Survey
CML&C	cement mortar lined and coated
CNEL	Community Noise Equivalent Level
cy	cubic yard
dB	decibel
dBA	A-weighted sound level
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EMWD	Eastern Municipal Water District
EOP	Emergency Operations Plan
FEMA	U.S. Department of Homeland Security Federal Emergency Management Agency
FHSZ	fire hazard severity zone
FMMP	Farmland Mapping and Monitoring Program
FTA	U.S. Department of Transportation Federal Transit Administration
GHG	greenhouse gas

Acronym	Definition
GSP	groundwater sustainability plan
hp	horsepower
HUSD	Hemet Unified School District
IS	initial study
IS/MND	Initial Study/Mitigated Negative Declaration
kW	kilowatt
L_{eq}	equivalent sound level
L_{max}	maximum sound level
LF	linear feet
LHMP	Riverside Operational Area Multi-Jurisdictional Local Hazard Mitigation Plan
LHMWD	Lake Hemet Municipal Water District
LOS	level of service
ND	Negative Declaration
NPDES	National Pollutant Discharge Elimination System
MND	Mitigated Negative Declaration
MMRP	Mitigation Monitoring and Reporting Program
MRZ	mineral resource zone
MSHCP	Western Riverside County Multi-Species Habitat Conservation Plan
O&M	operation and maintenance
OSHA	Occupational Safety and Health Administration
PPV	peak particle velocity
PVC	polyvinyl chloride
RCFC	Riverside County Flood Control and Water Conservation District
RWQCB	Santa Ana Regional Water Quality Control Board
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments

Acronym	Definition
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SGMA	Sustainable Groundwater Management Act
SRA	State Responsibility Area
SWPPP	Storm Water Pollution Prevention Plan
UWMP	Urban Water Management Plan
VdB	vibration decibels
VHFHSZ	very high fire hazard severity zone
VMT	vehicle miles traveled
Watermaster	Hemet-San Jacinto Watermaster

1. INTRODUCTION

1.1 Purpose of this Document

Eastern Municipal Water District (EMWD) has prepared this Initial Study (IS) to evaluate the potential environmental impacts related to implementation of the Mission Canyon II Pump Station and Pipeline Project (the "proposed Project" or "Project"), which consists of construction and operation of a new pump station and potable water transmission pipelines as well as demolition and abandonment of existing facilities.

EMWD is the lead agency under the California Environmental Quality Act (CEQA) for the proposed Project. CEQA requires that the lead agency prepare an IS to determine whether an Environmental Impact Report (EIR), Negative Declaration (ND), or Mitigated Negative Declaration (MND) is needed. EMWD has prepared this IS to evaluate the potential environmental consequences associated with the Mission Canyon II Pump Station and Pipeline Project, and to disclose to the public and decision makers the potential environmental effects of the proposed Project. Based on the analysis presented herein, an MND is the appropriate level of environmental documentation for the proposed Project.

1.2 Scope of this Document

This IS/MND has been prepared in accordance with CEQA (as amended) (Public Resources Code Section 21000 et. Seq.) and the State CEQA Guidelines (California Code of Regulations, Title 14, Chapter 3, Section 15000 et. Seq.), as updated on December 28, 2018. CEQA Guidelines Section 15063 describes the requirements for an IS and Sections 15070–15075 describe the process for the preparation of an MND. Where appropriate, this document refers to either the CEQA Statute or State CEQA Guidelines (as amended in December 2018). This IS/MND contains all of the contents required by CEQA, which includes a project description, a description of the environmental setting, potential environmental impacts, mitigation measures for any significant effects, consistency with plans and policies, and names of preparers.

This IS/MND evaluates the potential for environmental impacts to resource areas identified in Appendix G of the State CEQA Guidelines (as amended in December 2018). The environmental resource areas analyzed in this document include:

- Aesthetics
- Agriculture and Forestry Resources
- Air Quality
- Land Use and Planning
- Mineral Resources
- Noise

- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Population and Housing
- Public Services
- Recreation
- Transportation
- Tribal Cultural Resources
- Utilities and Service Systems
- Wildfire
- Mandatory Findings of Significance

1.3 Impact Terminology

The level of significance for each resource area uses CEQA terminology as specified below:

No Impact. No adverse environmental consequences have been identified for the resource or the consequences are negligible or undetectable.

Less than Significant Impact. Potential adverse environmental consequences have been identified. However, they are not adverse enough to meet the significance threshold criteria for that resource. No mitigation measures are required.

Less than Significant with Mitigation Incorporated. Adverse environmental consequences that have the potential to be significant but can be reduced to less than significant levels through the application of identified mitigation strategies that have not already been incorporated into the proposed project.

Potentially Significant. Adverse environmental consequences that have the potential to be significant according to the threshold criteria identified for the resource, even after mitigation strategies are applied and/or an adverse effect that could be significant and for which no mitigation has been identified. If any potentially significant impacts are identified, an EIR must be prepared to meet the requirements of CEQA.

1.4 CEQA Process

In accordance with CEQA Guidelines Section 15073, this Draft IS/MND will be circulated for a 30-day public review period (March 20, 2024 – April 18, 2024) to local and state agencies, and to interested organizations and individuals who may wish to review and comment on the report. EMWD will circulate the Draft IS/MND to the State Clearinghouse for distribution to State agencies. In addition, EMWD will circulate a Notice of Intent to

Adopt a Mitigated Negative Declaration to the Riverside County Clerk, responsible agencies, and interested entities. A copy of the Draft IS/MND will be available for review at: https://www.emwd.org/public-notices.

Written comments can be submitted to EMWD by 5:00 p.m. on April 18, 2024 and addressed to:

Joseph Broadhead, Principal Water Resources Specialist – CEQA/NEPA
Eastern Municipal Water District
2270 Trumble Road
P.O. Box 8300
Perris, CA 92572-8300
broadhej@emwd.org

Following the 30-day public review period, EMWD will evaluate all comments received on the Draft IS/MND and incorporate any substantial evidence that the proposed Project could have an impact on the environment into the Final IS/MND and prepare a Mitigation Monitoring and Reporting Program (MMRP).

The IS/MND and MMRP will be considered for adoption by the EMWD Board of Directors in compliance with CEQA at a future publicly noticed hearing, which are held on the 1st and 3rd Wednesday of each month at EMWD's headquarters.

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2. PROJECT DESCRIPTION

2.1 Project Overview

The Mission Canyon II Pump Station and Pipeline Project involves the construction and operation of a new pump station and associated pipelines to address hydraulic capacity issues of the existing Mission Canyon II Pump Station. The Project also includes demolition of the existing Mission Canyon II Pump Station and abandonment of an existing pipeline that would no longer be used. Specifically, EMWD proposes the following seven Project components which are shown in **Figure 2-1**.

1) Construct new Mission Canyon II Pump Station facility adjacent to Gibbel Road;
2) Demolish existing Mission Canyon II Pump Station located off Gibble Road west of Crow Road;
3) Install approximately 3,200 linear feet (LF) of new 12-inch pipeline in Gibbel Road south of the new pump station;
4) Replace the existing 4-inch pipeline along Gibbel Road to the intersection with Polly Butte Road with approximately 1,100 LF of 8-inch pipeline;
5) Abandon approximately 3,050 LF of an existing 6-inch discharge pipeline from the existing Mission Canyon II Pump Station to the last service uphill of Polly Butte Road;
6) Construct 1,050 LF of 2-inch service line from the existing 6-inch pipeline along Gibbel Road to 40751 Gibbel Road; and
7) Replace the existing 6-inch pipeline along Polly Butte Road to the abandoned pipeline with approximately 1,100 LF of 8-inch pipeline.

2.2 Project Purpose

EMWD's 2016 Master Plan identified the need to replace the Mission Canyon II Pump Station along with other improvements in the Mission Canyon II 2264 Pressure Zone to address existing and future hydraulic deficiencies. The existing Mission Canyon II Pump Station consists of two identical 25-horsepower (hp) pumps (200 gallons per minute [gpm]) that have electrical motors with an on-site power generator. The pump station is located outdoors, with no enclosure. In 2018, a follow-up study recommended the Mission Canyon II Pump Station be relocated and consist of two 200 gpm, 40 hp, domestic pumps, and two 750 gpm, 75 hp, fire pumps. Additionally, EMWD is seeking to improve facility resilience to wildfire hazards, and the existing Mission Canyon II Pump Station was one of the critical facilities identified for replacement. EMWD’s preference is to relocate the pump station due to its current proximity to brush and having limited access (Ardurra 2023).

The overall objectives of the Project are to:

- Correct existing and future hydraulic deficiencies of existing facilities;
- Design a replacement pump station that minimizes potential for local hazards, such as vandalism, wildfire, flooding, and limited site access;
- Continue to provide potable water supply to existing connections;
- Properly abandon facilities that would no longer be in use; and
- Accommodate future water demand in unincorporated Riverside County.

2.3 Project Location

The proposed Project is located in unincorporated Riverside County, California, primarily along Gibbel Road, east of State Street (see **Figure 2-1**), and within the City of Hemet sphere of influence. The Project area is within Township 5 South, Range 1 West, Sections 26, 25, 35, and 36. **Figure 2-2** shows the location of the Project components.

Figure 2-1: Regional Location

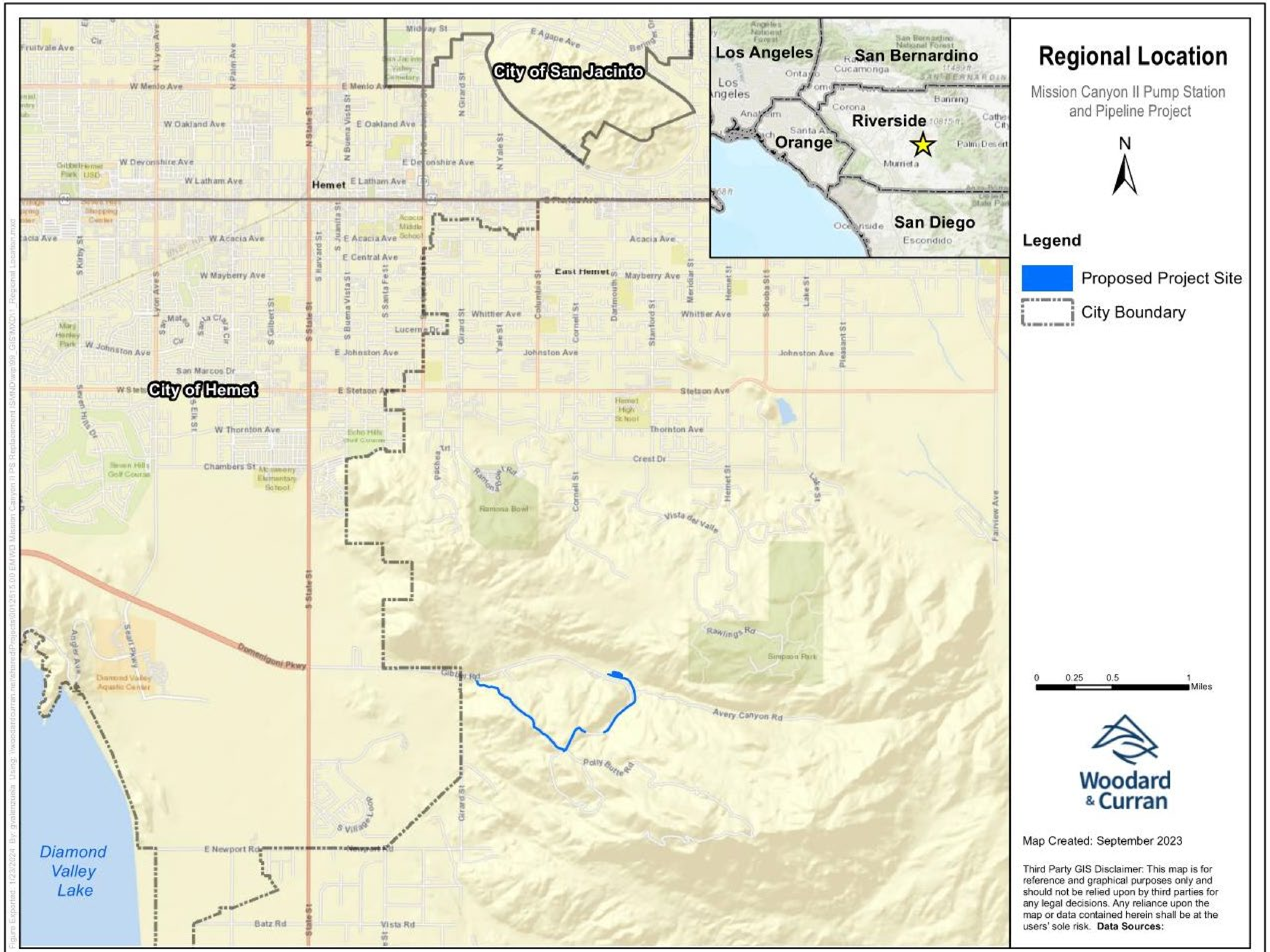
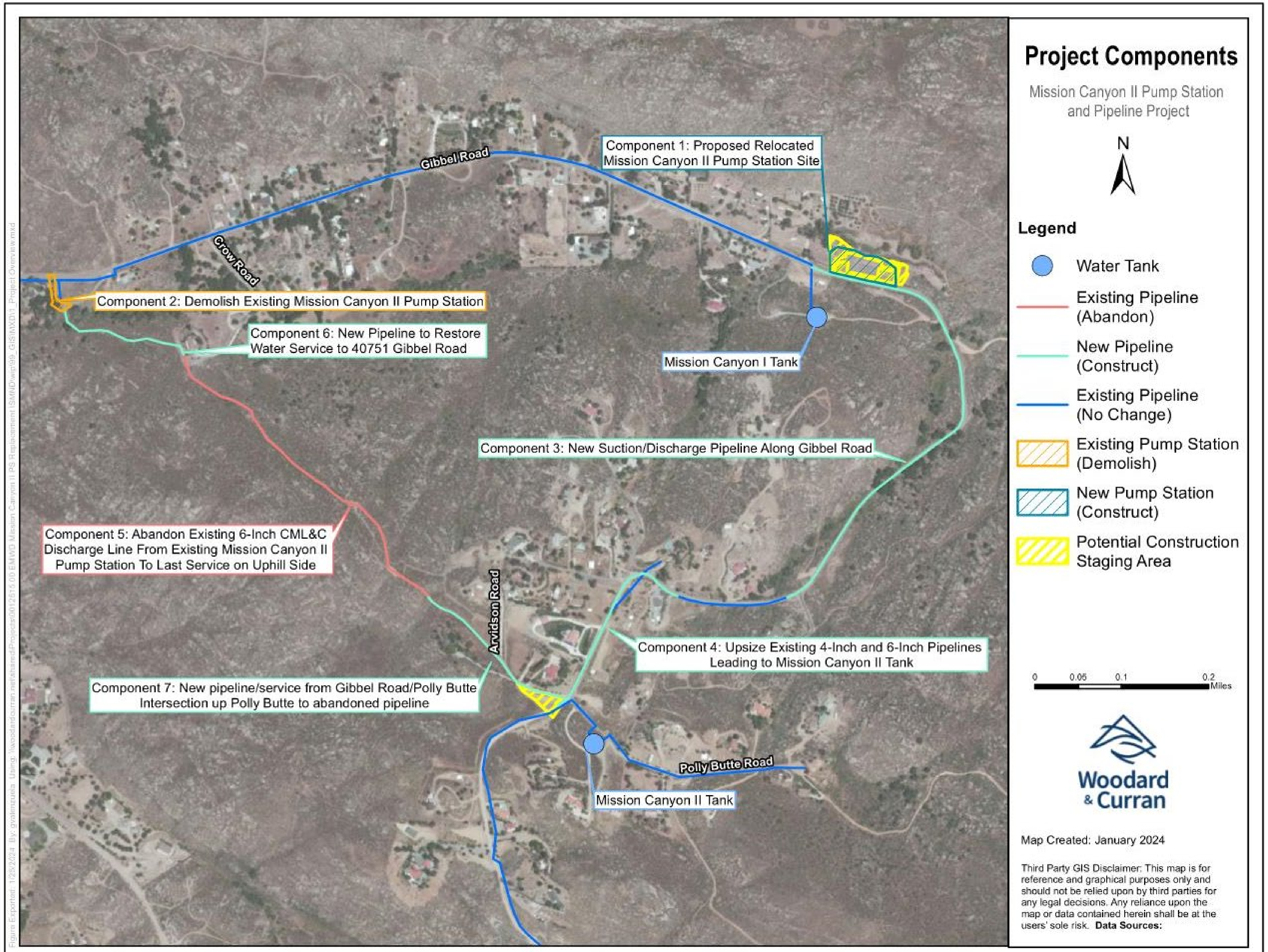


Figure 2-2: Project Overview



2.4 Proposed Project Description

As described in Section 2.1 Project Overview and shown on **Figure 2-2**, the proposed Project involves construction and operation of a replacement pump station and associated pipelines, as well as demolition of the existing Mission Canyon II Pump Station and abandonment of a pipeline that would no longer be used. The proposed pipelines would connect to existing 6-inch and 8-inch cement mortar lined and coated (CML&C) steel pipelines within Gibbel Road and Polly Butte Road.

2.4.1 Construction of Proposed Mission Canyon II Pump Station

The proposed Mission Canyon II Pump Station (component 1) would be constructed on the north side of Gibbel Road, approximately 650 feet northwest of Avery Canyon Road, in the southwest corner of Assessor's Parcel Number 450-210-022. Site development would occur on approximately 1.5 acres and would include:

- pump station building (25-feet by 15-feet) and associated pipeline and appurtenances;
- electrical generator building (12-feet by 5-feet);
- surge tank;
- transformer;
- perimeter block wall (8-feet, concrete masonry unit);
- communication antenna and tower (40-feet tall) for pump station data communications and control system;
- security lighting;
- motor-operated wrought iron gate;
- drainage improvements, including a rip rap wall on north, west and east perimeter within the property boundaries; and
- concrete paved driveways off Gibbel Road.

Approximately 8,000 cubic yards (cy) of imported soil would be used to elevate the construction pad for the pump station facilities and avoid potential flood hazards associated with the adjacent drainage which is recognized as a state flood hazard zone. The graded construction pad would be approximately 6 to 8 feet higher than the adjacent ground surface. No construction dewatering is anticipated, and potable water would be utilized for dust control.

The pump station and electrical generator buildings would house all noise-generating equipment and would be fully enclosed and designed to attenuate any noise associated with pump station operation., The aboveground structures, including building and wall height, color, and exterior architectural treatments, would be designed to blend into the existing visual character of the area. While permanent exterior lighting would be installed at the Project site, the fixtures would be of the lowest illumination necessary for security and shielded and directed downward to avoid light spillage onto neighboring properties.

The site would change from 100 percent pervious surface area to approximately 70 percent pervious with new areas of asphalt and concrete paving around the pump station and generator buildings and driveways off Gibbel Road. Storm water runoff would be directed by new on-site curb and gutters to flow southerly through a rip rap-lined drainage swale on the south side of the facility (away from Gibbel Road), and then flow westerly under the proposed facility access road via an 18-inch reinforced concrete pipe. The pipe would outlet to a gravel area for percolation. In larger storms, site runoff would flow over a rip rap berm into the adjacent natural drainage area. Storm drainage would be designed in accordance with Riverside County Flood Control and Water Conservation District flood control and water quality requirements.

Figure 2-3a and **Figure 2-3b** show the proposed Mission Canyon II Pump Station site plan with site grading contours. **Figure 2-4** and **Figure 2-5** show the mechanical design plans and sections for the pump station and electrical generator buildings, respectively.

Figure 2-3a: Proposed Mission Canyon II Pump Station Site Plan (west portion)

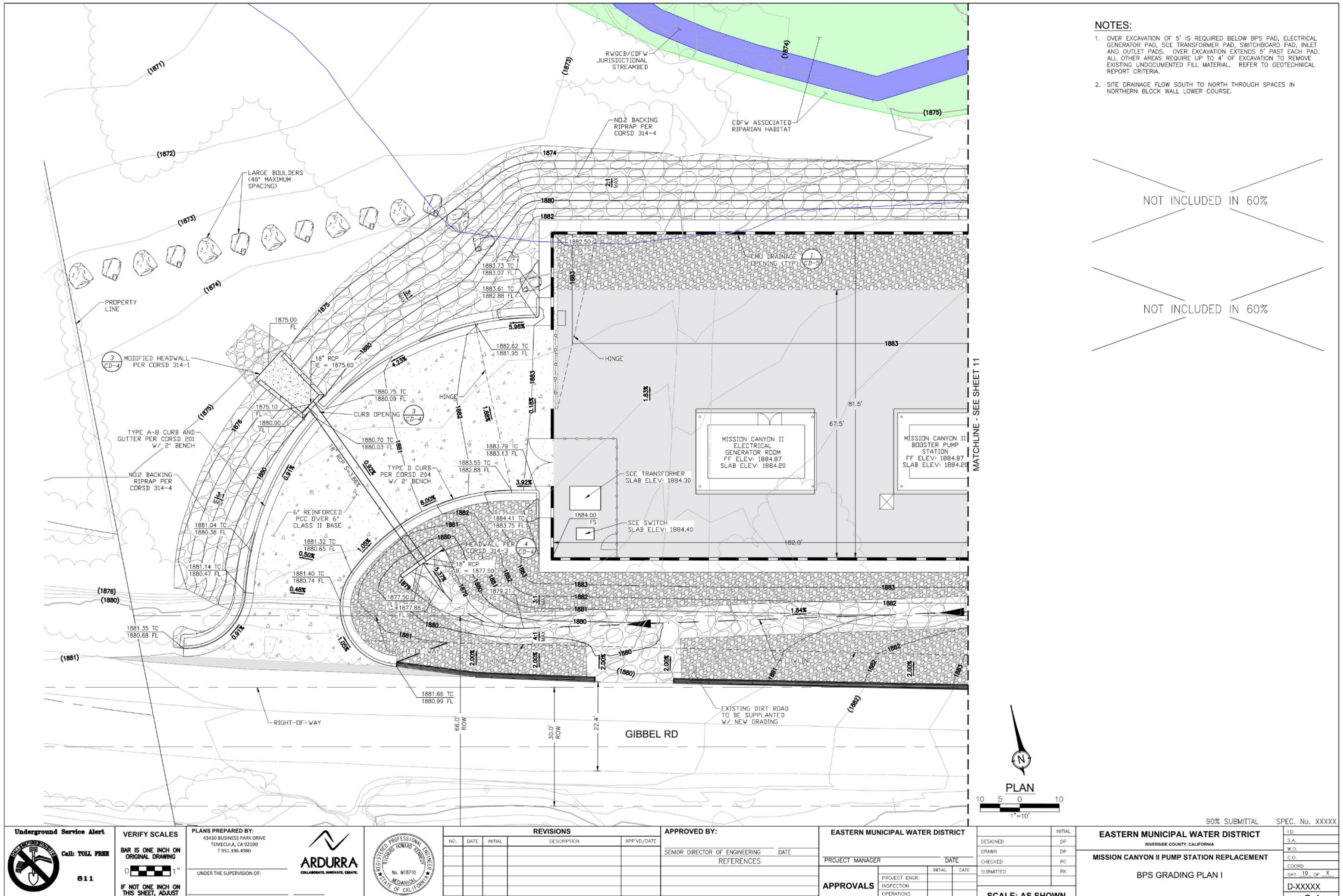


Figure 2-3b: Proposed Mission Canyon II Pump Station Site Plan (east portion)

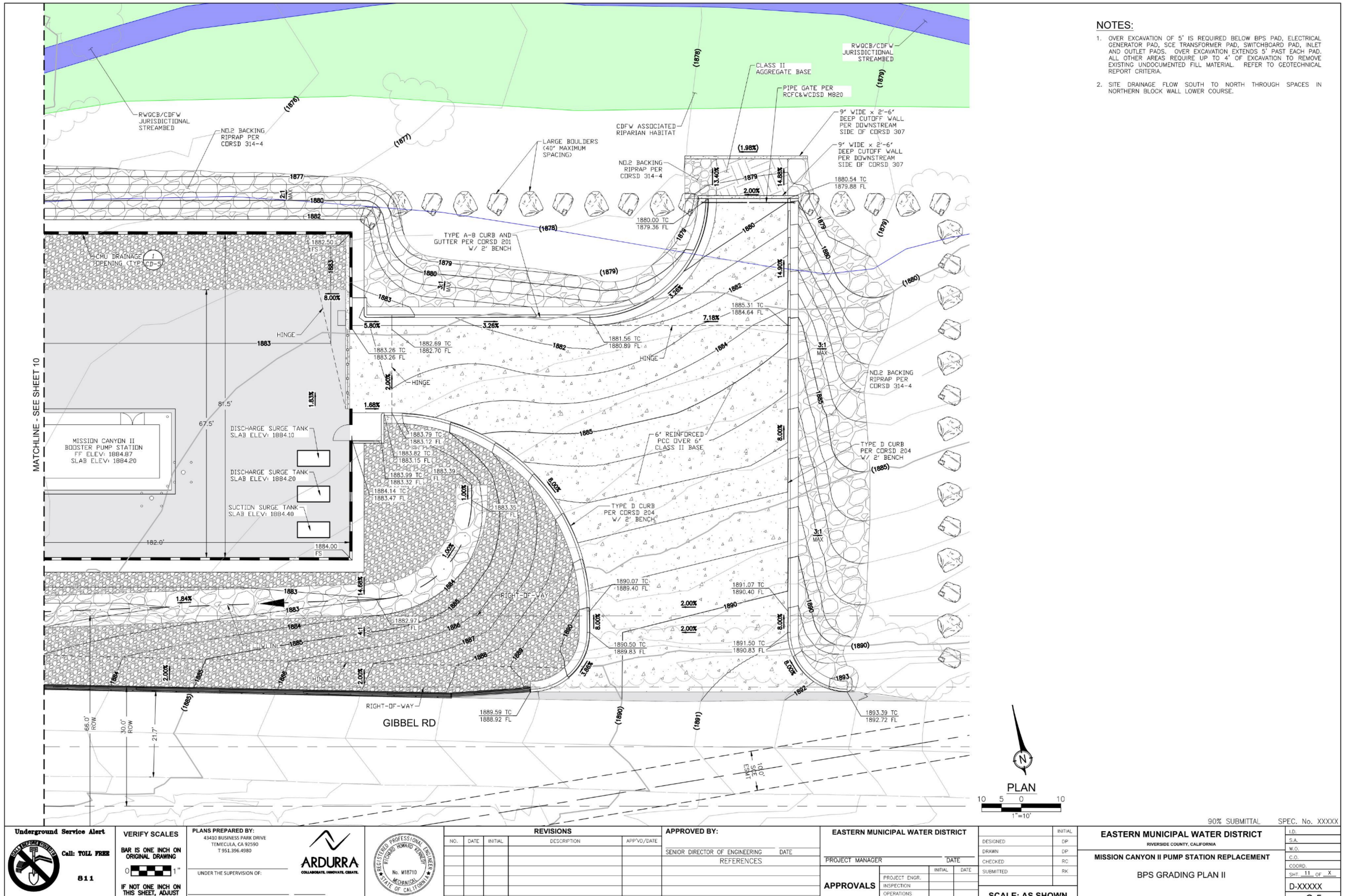


Figure 2-4: Pump Station Mechanical Plans & Sections

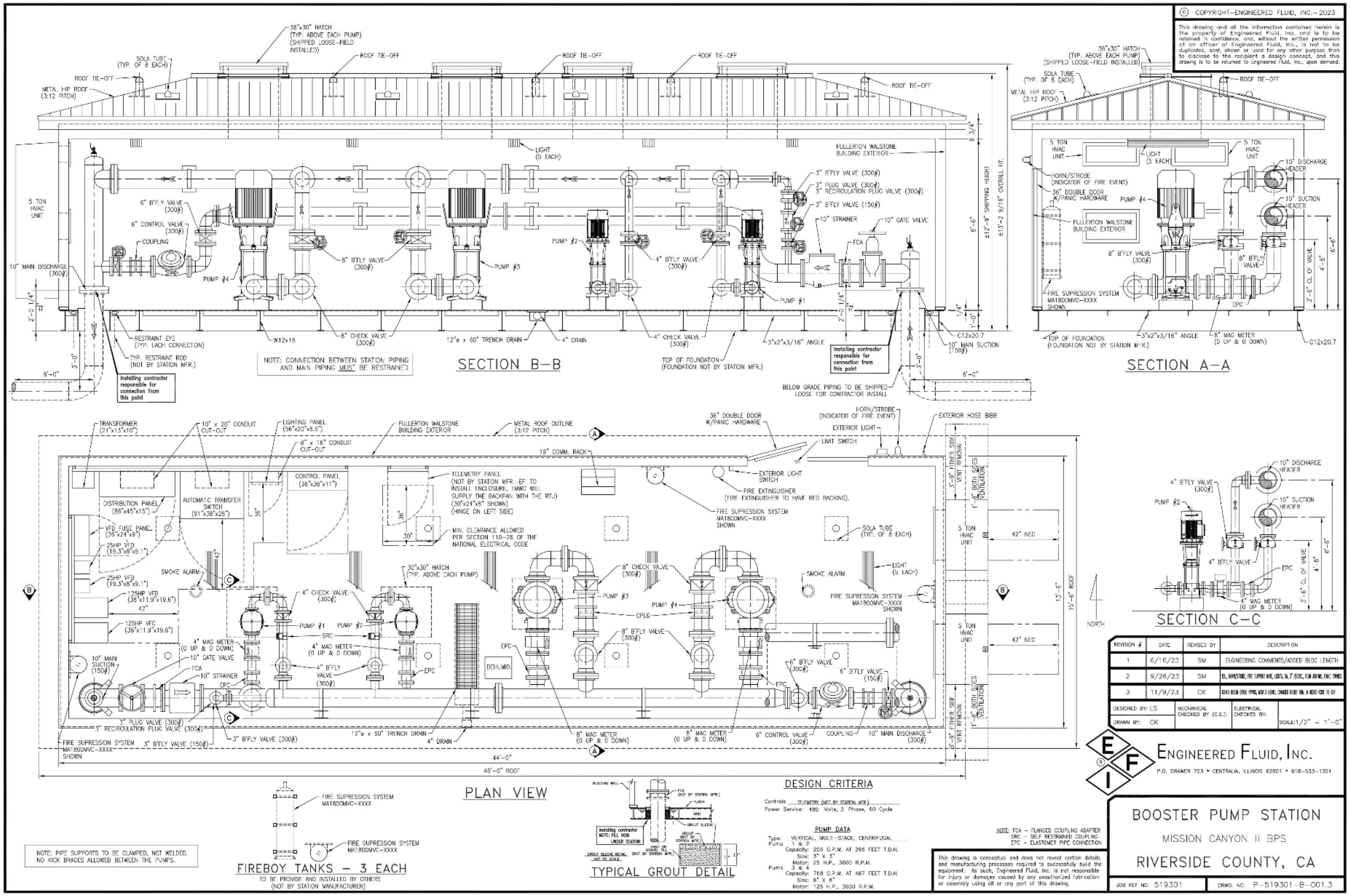
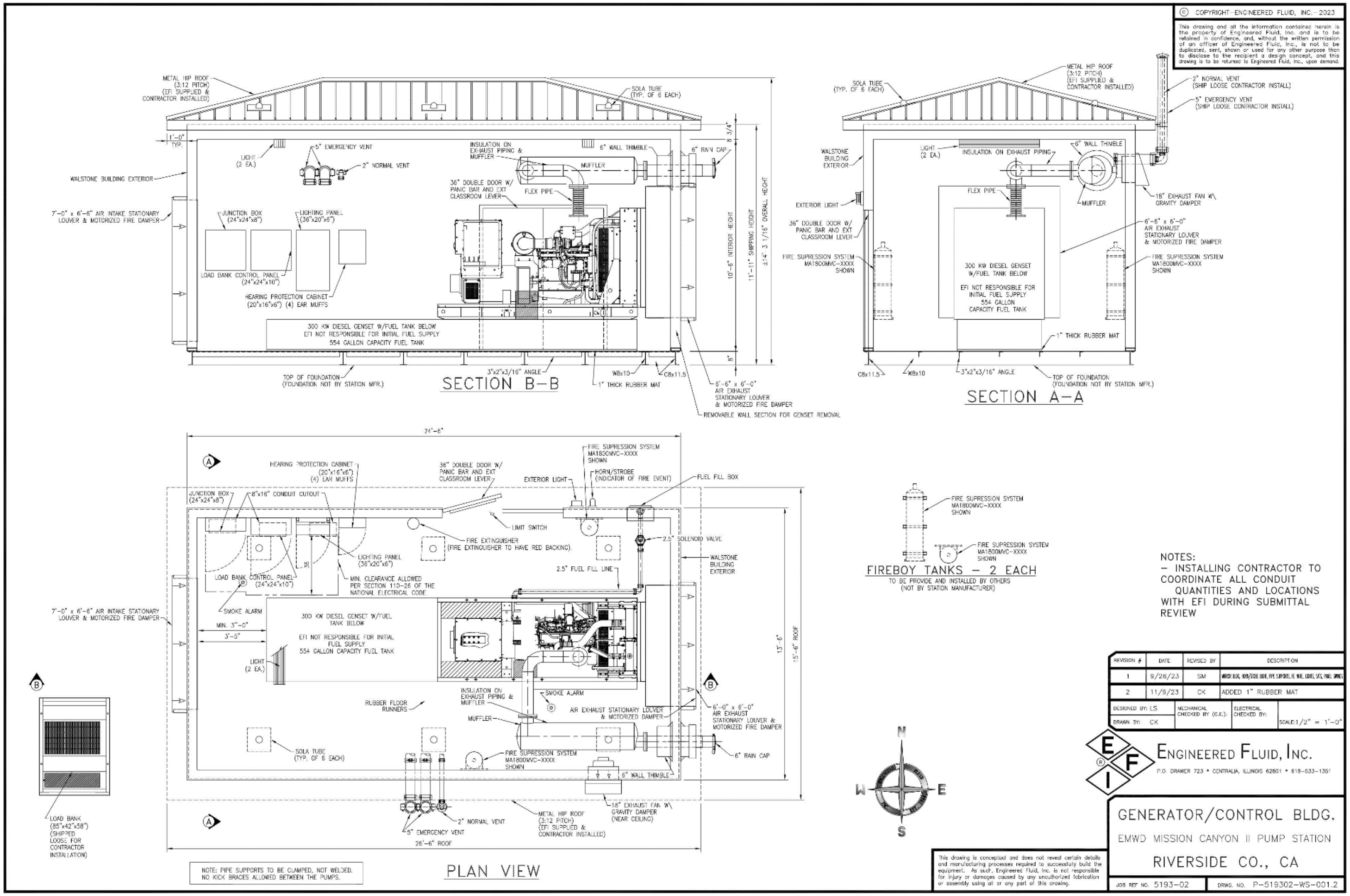


Figure 2-5: Electrical Power Generator Mechanical Plans & Sections



2.4.2 Demolition of Existing Mission Canyon II Pump Station

The existing Mission Canyon II Pump Station (component 2) would be demolished. Above ground infrastructure and appurtenances would be removed and underground pipes up to approximately 10 feet from the pump station would be excavated and removed. The remaining belowground pipe would be abandoned in place and used as a slip-line for a new service pipeline to 40751 Gibbel Road. Demolished material would be hauled to the nearest available landfill via Gibbel Road. After the above ground pump station infrastructure and associated belowground pipeline are removed, disturbed ground surface would be restored to original grade and preconstruction conditions.

2.4.3 Installation of New and Replacement Pipeline

The Project proposes construction and operation of approximately 6,450 linear feet of new and replacement polyvinyl chloride (PVC) pipe from the replacement pump station connection. The proposed segments include:

- approximately 3,200 LF of new 12-inch pipeline along Gibbel Road south of the new pump station (component 3);
- approximately 1,100 LF of new 8-inch pipeline along Gibbel Road to the intersection with Polly Butte Road to replace the existing 4-inch pipeline (component 4);
- approximately 1,050 LF of new 2-inch service line from Gibbel Road to 40751 Gibbel Road to replace the existing 6-inch pipeline (component 6); this pipeline is expected to be slipped-line into the existing pipeline, and would require excavation of small individual pits as needed to help move the new pipeline through angled portion of the pipe; and
- approximately 1,100 LF of new 8-inch pipeline along Polly Butte Road to the abandoned pipeline to replace the existing 6-inch pipeline (component 7).

The proposed pipelines would be installed within the rights-of-way of Gibbel Road and a small portion of Polly Butte Road using open-cut trench construction. The trench width would average 3 feet (maximum width would not exceed 4 feet), and trench depth would average 6 feet (maximum depth would not exceed 7 feet). The pipeline alignment would be designed to avoid conflict with existing utilities. Open cut cross-section for the pipeline would follow EMWD standards (see **Figure 2-6**). Native soil would be reused for backfill to the greatest extent possible. Any existing culverts that intersect the Project alignment would be protected in place.

After construction is complete, all pipeline construction areas would be restored to pre-construction conditions. Replacement of pavement would follow Riverside County standards (see **Figure 2-7**).

2.4.4 Abandonment of Existing 6-inch Discharge Line

The existing 6-inch CML&C discharge line from the existing Mission Canyon II Pump Station to the last service on the uphill side of Polly Butte Road would be abandoned in place (component 5). The pipeline would be capped at the water service meter at 40751 Gibbel Road and water service meter east of 29250 Polly Butte Road (see **Figure 2-2**). No pipe would be removed, and no excavation would be required.

Figure 2-6: EMWD Standards for Open Cut Pipeline Construction

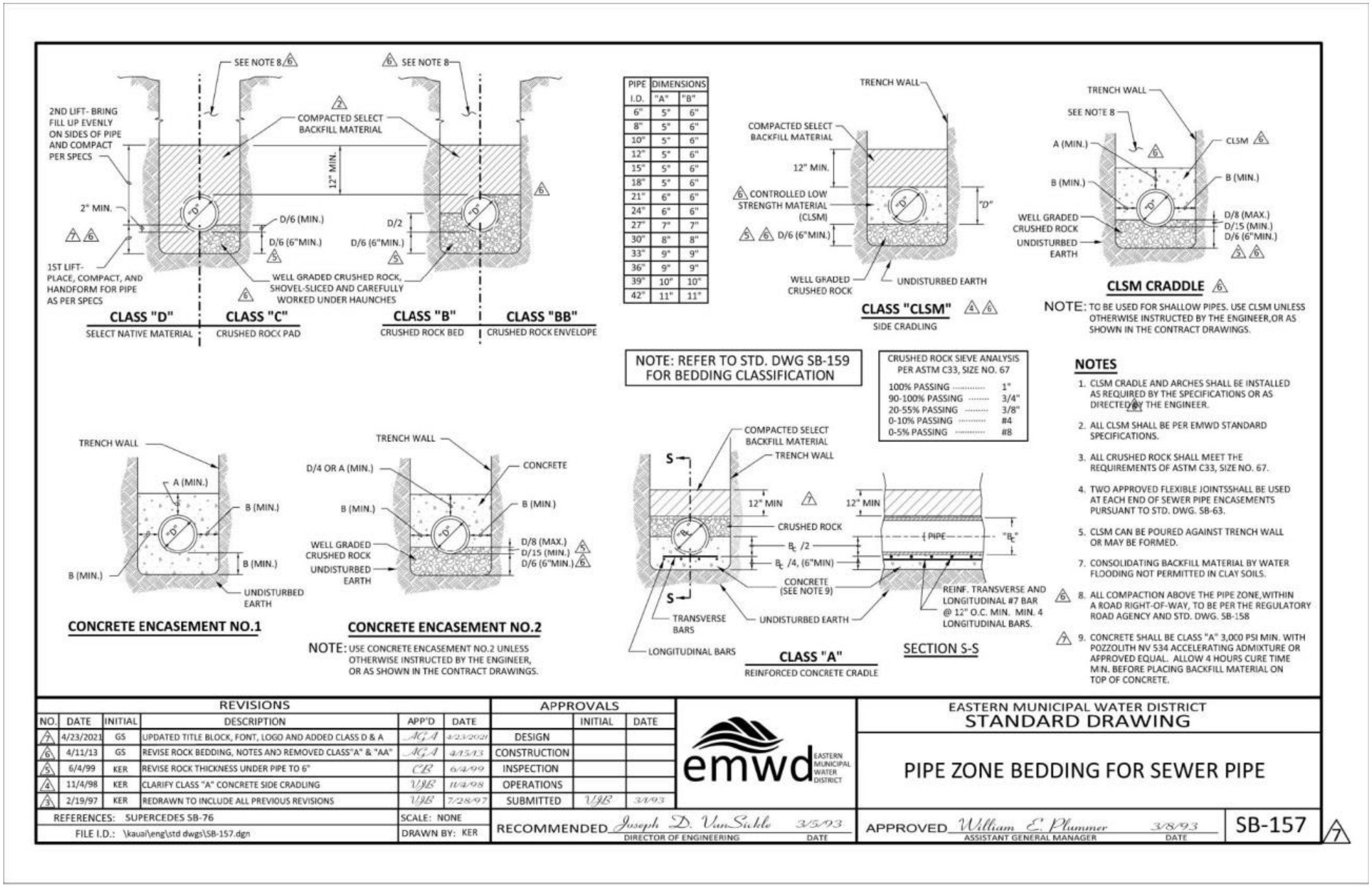


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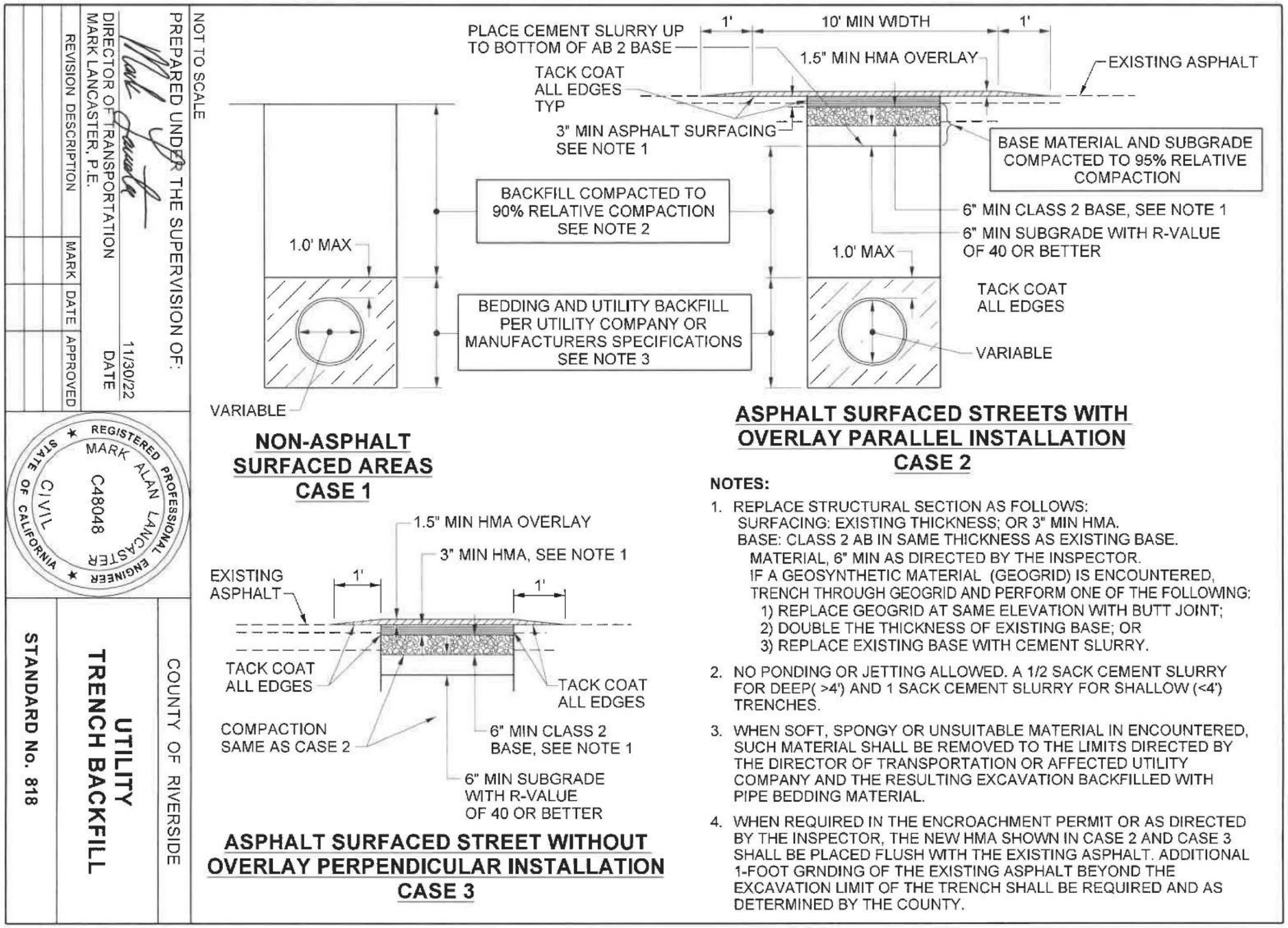
Figure 2-7: Riverside County Standards for Pavement Resurfacing



2.4.5 Construction Equipment

Construction of the proposed Mission Canyon II Pump Station and the new and replacement pipelines would require the estimated construction equipment shown in **Table 2-1** and **Table 2-2** respectively.

Table 2-1: Construction Vehicle Fleet - Pump Station Construction

Equipment	Number Required
Backhoe/Loader	2
Excavator	1
Forklift	1
Concrete Pumper	1
Crane	1
Utility Truck	1
Water Truck	1
Welder	1
Air Compressor	1
Pump	1
Generator	1

Table 2-2: Construction Vehicle Fleet - Pipelines and Pump Station Demolition

Equipment	Number Required
Backhoe/Loader	1
Excavator	1
Utility Truck	1
Water Truck	1
Dump Truck	2
Concrete Saw	1
Pavement Breaker	1
Sweeper	1
Paver	1

The maximum volume of material to be excavated from construction of the pipeline is estimated to be approximately 6,689 cubic yards (4-foot pipeline trench width x 7-foot pipeline trench depth x 6,450 feet long). It is expected that approximately 90 percent of excavated material would be reused onsite as trench backfill; however, this would not be determined until excavation starts. Any excavated soil not reused on site would be hauled offsite for disposal. After construction is complete, all pipeline construction areas would be restored to pre-construction conditions (i.e., no permanent disturbance footprint).

2.4.6 Construction Schedule

Project construction is conservatively estimated to last approximately 386 working days, beginning in approximately August 2024 and continuing until approximately February 2026. Rough grading of the proposed Mission Canyon II Pump Station site is anticipated to last two months and site improvements are anticipated to last an additional two months. The trenching duration is anticipated to last 16 weeks.

Construction is not limited to set hours because construction noise associated with capital improvement projects is exempt from Riverside County code of ordinances regarding noise regulation (County of Riverside 2006). However, construction is anticipated to take place on weekdays during daytime hours.

2.4.7 Construction Staging Areas

EMWD has identified two construction staging area options for evaluation in this environmental analysis, however, the final areas would be determined at a later stage. The staging area options are shown in **Figure 2-2** and include:

- Northern, eastern, and western portions of the EMWD-owned parcel for the proposed Mission Canyon II Pump Station. This parcel could also serve to store pipes and equipment to be installed in the Gibbel Road right-of-way. All construction staging in this area would be located outside potential jurisdictional drainage areas.
- A turnout of the dirt road near the intersection of Gibbel Road and Polly Butte Road.

2.5 Proposed Project Operation

Since the proposed Mission Canyon II Pump Station would replace the existing Mission Canyon II Pump Station, it is anticipated that there would be no overall change to EMWD's existing operation and maintenance (O&M) schedule. No additional vehicle trips or employees would be needed for O&M of the replacement Mission Canyon II Pump Station. Use of the proposed 300-kilowatt (kW) generator would be limited to emergencies and during pump maintenance once per month. The energy consumption of the replacement pump station would be the same as the existing Mission Canyon II Pump Station.

The proposed Project pipelines would not be associated with long-term energy usage or additional EMWD O&M activities. Project O&M activities would include inspection and repair, as necessary, of air vacuum valves, blowoff valves, and fire hydrants; valve exercising; and possible flushing and sampling of water quality. Inspection of the above ground appurtenances and exercise of the valves would be incorporated into EMWD's existing O&M activities.

2.6 EMWD Standard Construction Practices

The following measures are EMWD standard construction practices that would be implemented as part of the Project:

- Design and construction of the facilities would be based on a soils report and geotechnical investigation prepared for the Project. Design and construction would also be in compliance with applicable standards the American Water Works Association, the Greenbook" Standard Specifications for Public Works Construction (Greenbook Committee of Public Works Standards, Inc. 2021), the International Building Code (International Code Council 2021), and the California Building Code (California Code of Regulations, Title 24, Part 2).

- EMWD would comply with all applicable federal, state, and local regulations pertaining to hazardous materials, including Federal Code Title 40 and 49; Occupational Safety and Health Administration (OSHA) 29 CFR 1910; California code section 5001, 5401, 5701, and 25507; California Health and Safety Code Division 20, Chapter 6.5, Article 6.5, Article 6.6, and Article 13; and Riverside County ordinance 651.5. Additionally, the contractor would be required to comply with EMWD Detailed Provisions Section 02201 – Construction Methods & Earthwork of the Standard Detailed Provisions for Flammable or Toxic Materials to prevent spontaneous combustion or dispersion.

- EMWD and its contractors would be required to adhere to EMWD's General Safety Requirements for Hazardous Materials and Hazardous Waste (Specification 1.15 of Section 01000-7) which require proper communication of hazardous substances on a project site, proper storage and disposal of hazardous substances on the site, and clean-up of any spills in accordance with manufacturer's, and/or EPA requirements.

- EMWD would comply with federal hazardous materials transportation law (49 U.S.C. 5101 et seq.), and California Health and Safety Code Division 20, Chapter 6.5, Article 6.5 which require precautionary measures be taken during the routine transport of hazardous materials, such as testing and preparation of a transportation safety plan. According to California Health and Safety Code Division 20, Chapter 6.5, Article 13, used oil that may be produced from construction or operation of the Project would be recycled.

- For any required dewatering, dichlorination, and disposal of water from well and pipeline testing/flushing activities, discharge of all water will abide by EMWD's NPDES discharge permit in accordance with EMWD Engineering Special Provision for Pipeline Connection and Disinfection.

- Prior to Project construction, EMWD would require its construction contractor to prepare a Traffic Control and Detour Plan in accordance with US Department of Transportation Manual of Uniform Traffic Control Devices and the California Department of Transportation (Caltrans) Manual of Uniform Traffic Control Devices, and Permit requirements, and local Riverside County traffic control requirements. At a minimum, the plan would:
    - Identify staging locations to be used during construction;
    - Identify safe ingress and egress points from staging areas;
    - Identify potential road closures;
    - Establish haul routes for construction-related vehicle traffic;
    - When work is not being performed, require trenches to be covered with an appropriate cover to restore normal traffic flow;
    - Include a detour plan that identifies alternative safe routes to maintain pedestrian and bicyclist safety during construction; and
    - Identify roadways and access points for emergency services; and require that disruptions to or closures of these lanes be minimized.
    - Include provisions for traffic control measures such as barricades, warning signs, cones, lights, and flag persons, to allow safe circulation of vehicle, bicycle, pedestrian, and emergency response traffic.

  The Traffic Control and Detour Plan would be reviewed and approved by EMWD's project manager and the construction inspector prior to Project construction. EMWD's construction inspector would also provide the construction schedule and Traffic Control and Detour Plan to the County of Riverside for review to ensure that construction of the proposed Project does not conflict with other construction projects that may be occurring simultaneously in the Project vicinity.

- All construction work would require the contractor to implement fire hazard reduction measures. In accordance with EMWD Specifications Detailed Provisions Section 02201 – Construction Methods & Earthwork of the Standard Detailed Provisions, the entire work and site, including storage areas, are inspected at frequent intervals to verify that fire prevention measures are constantly enforced; fully charged fire extinguishers of the appropriate type, supplemented with temporary fire hoses wherever an adequate water supply exists, are furnished and maintained; and flammable materials are stored in a manner that prevents spontaneous combustion or dispersion.

- Construction would comply with South Coast Air Quality Management District Rule 403 Fugitive Dust Control requirements as per EMWD's Dust Abatement procedures outlined in EMWD Specifications Detailed Provisions Section 02201 – Construction Methods & Earthwork of the Standard Detailed Provisions.
- EMWD's construction contractor would be required to comply with Engineering Special Provisions, Special Condition (SC)-09, which requires compliance the contractor to comply with California General Permit for Storm Water Discharges Associated with Construction Activity Order No. 2022-0057 DWQ (NPDES General Permit No. CAS000002), including preparation of a Stormwater Pollution Prevention Plan (SWPPP). Construction would implement BMPs to control water quality of stormwater discharges offsite, according to the SWPPP, such as site management "housekeeping," erosion control, sediment control, tracking control and wind erosion control.

2.7 Required Permits and Approvals

Anticipated permits are identified in **Table 2-3**. A California State Water Resources Control Board Division (SWRCB) of Drinking Water Waiver is not anticipated because the proposed Project's pipelines would be compliant with California's Waterworks Standards (Section 64572, Title 22, CCR) parallel and perpendicular separation criteria. In addition, the proposed Project does not cross any existing sewer mains, as the residences within the proposed Project area are connected to private septic tanks.

Table 2-3: Permits and Approvals

Agency	Permit/Approval
County of Riverside	Encroachment Permit
SWRCB	NPDES Construction General Permit for Storm Water Discharges
California Occupational Safety and Health Administration	Trenching/Shoring Permit

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3. ENVIRONMENTAL CHECKLIST FORM

1. **Project title:**	Mission Canyon II Pump Station and Pipeline Project
2. **Lead agency name and address:**	Eastern Municipal Water District 2270 Trumble Road P.O. Box 8300 Perris, CA 92572-8300
3. **Contact person and phone number:**	Joseph Broadhead, Principal Water Resources Specialist broadhej@emwd (951) 928-3777 ext. 4545
4. **Project location:**	Unincorporated Riverside County, California
5. **Project sponsor's name and address:**	Same as Lead Agency
6. **General plan designations:**	Rural Mountainous
7. **Zoning:**	RA – Residential Agricultural

8. **Description of project:** Mission Canyon II Pump Station and Pipeline Project involves the construction and operation of a new pump station and associated pipelines to address hydraulic capacity issues of the existing Mission Canyon II Pump Station. The Project also includes demolition of the existing Mission Canyon II Pump Station and abandonment of an existing pipeline that would no longer be used. The overall objectives of the Project are to: correct existing and future hydraulic deficiencies of existing facilities; design a replacement pump station that minimizes potential for local hazards, such as vandalism, wildfire, flooding, and limited site access; continue to provide potable water supply to existing connections; properly abandon facilities that would no longer be in use; and accommodate future water demand in unincorporated Riverside County.

9. **Surrounding land uses and setting:** The proposed Project area is located within unincorporated Riverside County, east of the City of Hemet. The Project area is situated within Avery Canyon, a small, narrow canyon that feeds into the San Jacinto Valley northeast of Diamond Valley Lake, and is characterized by open space with gentle hills, rock outcroppings, shrub vegetation, and rural residential properties

along rural paved and dirt roads. The Project area contains low density rural residential development.

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

- California Occupational Safety and Health Administration: Trenching/Shoring Permit
- California State Water Resources Control Board: NPDES Construction General Permit for Storm Water Discharges
- County of Riverside: Encroachment Permit

11. Have California Native American tribes traditionally and culturally affiliated with the Project area requested consultation pursuant to Public Resources Code section 2180.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?

In September 2023, EMWD sent outreach letters to Native American tribes, who are traditionally and culturally affiliated with the Project area and who have indicated to EMWD that they are interested in receiving notifications. Three tribe(s) requested consultation with EMWD: Pechanga Band of Luiseño Indians, Agua Caliente Band of Cahuilla Indians, and Soboba Band of Luiseño Indians. The consultation is currently in process.

Environmental Factors Potentially Affected

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

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

DETERMINATION: (To be completed by Lead Agency)

On the basis of this initial evaluation:

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

[X] 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 earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

Joe Broadhead

Signature

3/20/24

Date

Joseph Broadhead

Printed Name

Principal Water Resources Specialist

Title

3.1 Aesthetics

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

Discussion

The proposed Project area is located in unincorporated Riverside County, east of the City of Hemet within the Santa Rosa Hills. In addition to views of the San Jacinto Mountain foothills, the Project area contains numerous rock outcroppings of various sizes that are visually unique to the region. The policies of Riverside County General Plan Land Use Element (County of Riverside 2021) are intended to promote development that blends in with its surrounding environments and preserves view corridors and topographic vistas.

Riverside County Ordinance Number 655 regulates light pollution by restricting the permitted use of certain outdoor light fixtures that emit light into the night sky which have a detrimental effect on astronomical observation and research. It defines various zones relative to the distance between the light source and Palomar Observatory and sets requirements for shielding for various types of outdoor lighting (e.g., decorative, parking lots, walkways, security) (County of Riverside 1988).

The State of California Department of Transportation (Caltrans) manages the State scenic Highway Program which was created by the State Legislature in 1963 with the purpose of protecting the natural scenic beauty of California highways. State-designated scenic highways have locally adopted policies to preserve the scenic quality of the corridor. Highways receive designation based on how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. The nearest State-designated scenic highway is a section of State Route 74 beginning near the intersection with Blackburn Road, approximately 6.5 miles northeast of the Project area. The stretch of Highway 74 through the City of Hemet is a state eligible scenic highway (Caltrans 2023).

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

During construction, scenic views of surrounding hills, rock outcroppings, and mountains near the Project site (pump station site, pipeline alignment and potential staging areas) would be temporarily altered by construction equipment such as cranes and excavators. Once construction is complete, the new pipelines in roadways would be underground and all aboveground components at the demolished pump station site would be removed. Abandonment of the existing pipeline would have no visual effect. The Project's area of temporary disturbance along the roadways would be restored to its pre-construction condition, thus having no long-term impact on scenic vistas.

The only permanent aboveground Project component with the potential to result in long-term impacts on scenic vistas would be the replacement Mission Canyon II Pump Station, which includes a pump station building, electrical generator building, surge tank, transformer, 8-foot-tall perimeter block wall, and a 40-foot-tall, hinged communication tower (see *Section 2.4.1 Construction of Proposed Mission Canyon II Pump Station*). The pump station infrastructure and perimeter wall would be of similar height as residential buildings and livestock infrastructure along Gibbel Road and would only minimally obstruct scenic vistas from adjacent Gibble Road on the south. Much of the surrounding foothill ridges and open space areas are topographically higher and thus, the proposed pump station facilities would not substantially obstruct views of mountains and hillsides from the open space areas. Therefore, the Project would not substantially adversely impact local scenic vistas, and impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

None of the proposed Project components are located within the viewshed of an eligible or officially dedicated state scenic highway. Therefore, there would be no impact on scenic resources associated with a State scenic highway.

Mitigation Measures

None required or recommend.

Significance Determination

No impact.

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

Publicly accessible views of the Project are limited to vehicle travel within Gibbel Road and Polly Butte Road, which would be fleeting and only last on the order of seconds or minutes. During construction, scenic views of surrounding hills and mountains near the Project site (including potential staging areas) and along the Project alignment would be temporarily altered by construction equipment such as cranes and excavators. However, once construction is complete all construction related visual impacts would be removed. The pipelines would be constructed underground within existing roadway rights-of-way and all temporary areas of disturbance would be restored to pre-construction conditions. The existing pump station would be removed including all aboveground appurtenances, and abandonment of the existing 6-inch CML&C Discharge Line would have no visual effect. The aboveground structures within the relocated pump station site would be visible from Gibbel Road and the open space areas to the north.

As described under *Discussion* above, the Project area is under the jurisdiction of Riverside County and is subject to the policies established in the Riverside County General Plan. The Riverside County Land Use Element (County of Riverside 2021) policies are intended to promote development that blends in with its surrounding environments and preserves view corridors and topographic vistas. EMWD, as a public agency, is not subject to other jurisdictional agencies' established standards or ordinances. Nonetheless, buildings at the replacement Mission Canyon II Pump Station site would be designed and constructed to blend in with the existing visual character of the surrounding in terms of building and wall height, color, and exterior architectural treatments, as discussed in *Section 2.4.1 Construction of the Proposed Mission Canyon II Pump Station***.** While the 35-40-foot metal communications tower may be higher than most other existing structures in the area, it would be contained within the 8-foot concrete wall area surrounding the pump station which is set back over 30-feet from Gibble Road, and thus would not substantially degrade the existing visual character or quality of public views of the site and its surroundings. Therefore, Project impacts on visual character and public views would be less than significant with mitigation incorporated

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

Although construction of the proposed Project would be limited to the hours determined in the County of Riverside encroachment permit, construction activities would occur during daytime and no nighttime work would be required. While daytime construction would temporarily create a minor new source of light and glare from construction equipment, impacts are considered less than significant because construction would be temporary, and equipment would be removed once site restoration is complete.

Once construction is complete, wallpack lighting would be installed for security purposes at the relocated Mission Canyon II Pump Station site and would be the only new permanent source of light. Installation of the security lighting must conform to the Mount Palomar Nighttime Lighting Policy because the Project area is within the 45-mile zone radius of the Palomar Observatory and must comply with Zone B regulations. As discussed in *Section 2.4.1 Construction of Proposed Mission Canyon II Pump Station* permanent exterior security lighting would be shielded downward to avoid light spill onto neighboring properties, and thus, the Project would be in compliance with Riverside County Ordinance No. 655. Impacts would be less than significant. Construction of the below-ground pipelines would not result in a new source of light and glare. Therefore Project impacts associated with the project pipelines would be limited to temporary construction activities and would not result in a new source of light or glare. Impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

3.2 Agriculture and Forestry Resources

	Potentially Significant Impact	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
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 non-agricultural use?	[ ]	[ ]	[ ]	[X]
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	[ ]	[ ]	[ ]	[X]
c) Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	[ ]	[ ]	[ ]	[X]
D) Result in the loss of forest land or conversion of forest land to non-forest use?	[ ]	[ ]	[ ]	[X]
e) Involve other changes in the existing environment which, due	[ ]	[ ]	[ ]	[X]

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

The Project would be located solely on disturbed lands including paved and dirt roads and vacant disturbed parcels. The proposed Project area is designated primarily as Urban and Built-Up Land and Other Land by the California Department of Conservation (CDOC) Farmland Mapping and Monitoring Program (FMMP) (CDOC 2022a). There is no California Resources Agency designated farmland or Williamson Act contracted land within or adjacent to the Project (**Figure 3-1**). In addition, there are no Riverside County zoning designations or classifications for forestland, timberland, or timberland production on or adjacent to the Project site according to the Riverside County Mapping Portal (County of Riverside Mapping Portal 2023) or City of Hemet official zoning map (City of Hemet 2019) (**Figure 3-2**).

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

The proposed Project area is not located within or adjacent to any land designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use (**Figure 3-1**). Therefore, the proposed Project would not impact or result in the conversion of any farmland to non-agricultural use. There would be no impact.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

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

None of the Project components would be located on or adjacent to land zoned for agricultural use or protected by a Williamson Act contract (CDOC 2023). Therefore, no impact would occur as a result of the proposed Project.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

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

There are no lands zoned forest land, timberland, or timberland zoned Timberland Production present within the proposed Project area (**Figure 3-2**), nor are there any forestry or timberland resources within the Project area. Therefore, the proposed Project would have no impact related to the loss of forest land or timberland.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

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

There is no designated forest land or timberland within proposed Project area (Figure 3 2). Therefore, the proposed Project would have no impact related to the loss or conversion of forest land to non-forest use.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

Figure 3-1 Mapped Farmland

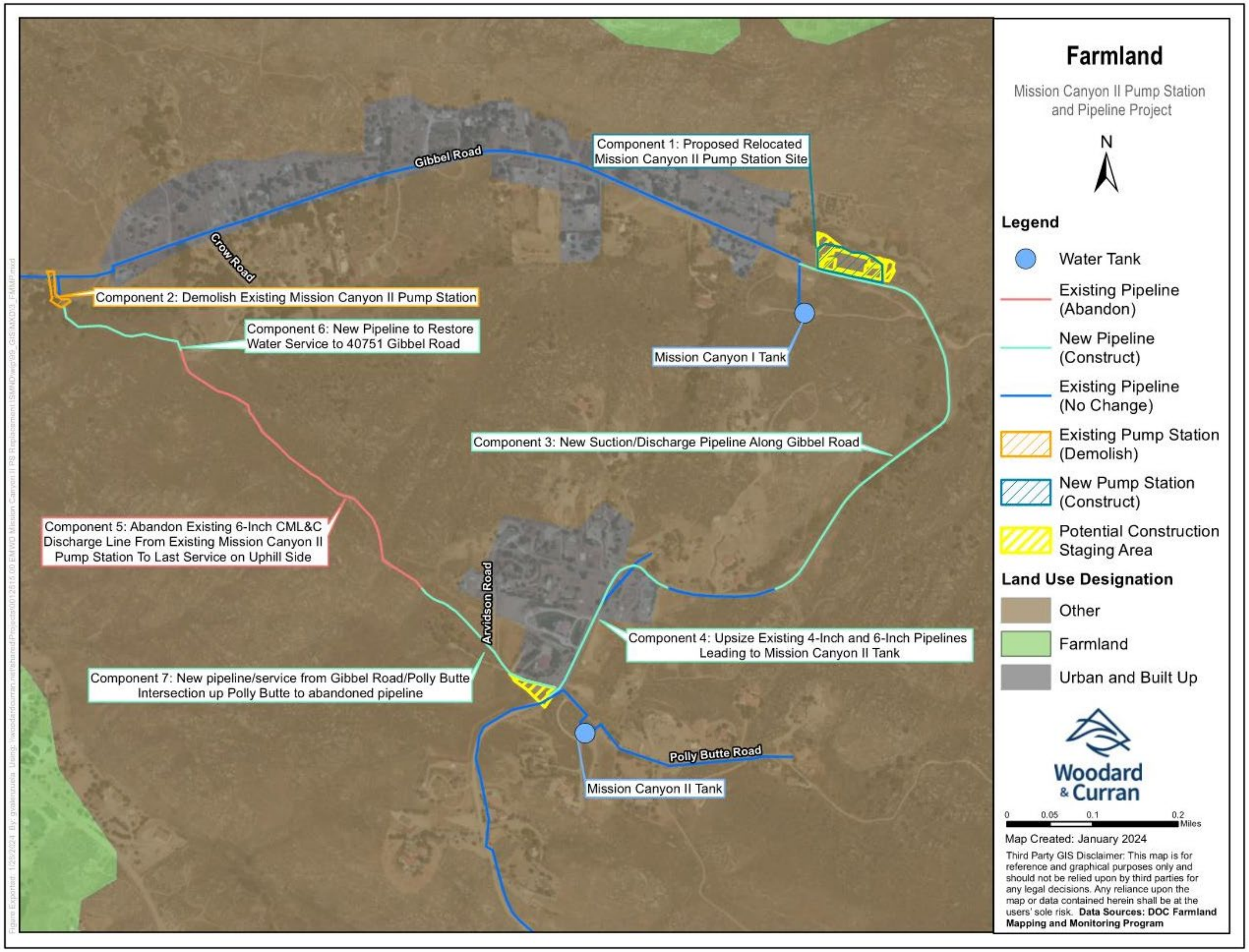
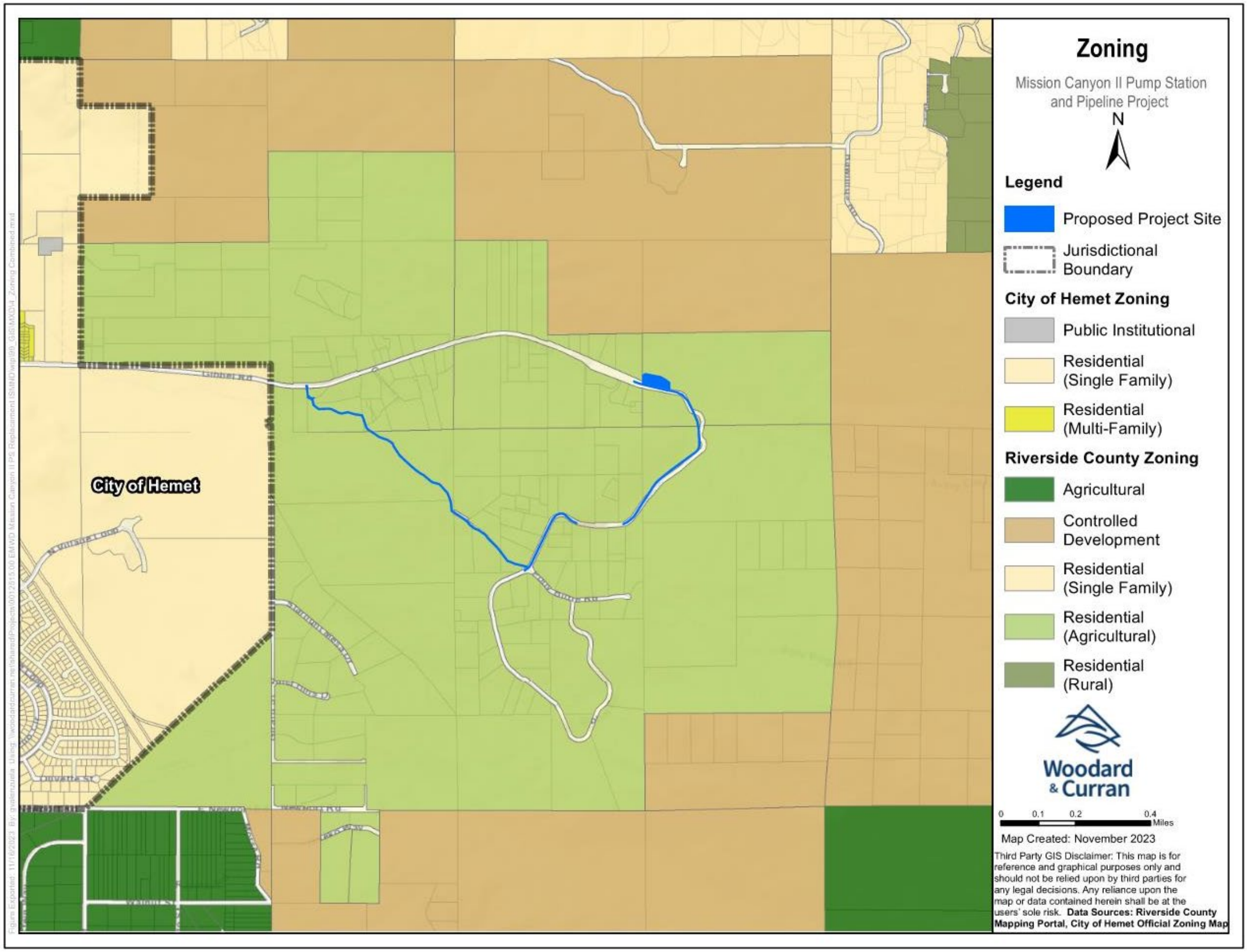


Figure 3-2: Riverside County General Plan – Zoning



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?

The proposed Project would improve EMWD's potable water system by increasing local hazard resiliency and transmission capacity. The replacement Mission Canyon II Pump Station would be designed to minimize potential for local hazards such as vandalism, wildfire, flooding, and limited site access, and would correct existing and future hydraulic deficiencies of the existing facilities. The proposed Project would have no impact on groundwater supplies and would not impede the ability of farmers to pump groundwater for irrigation use. The Project would not induce other changes in the environment that would result in conversion of agricultural land to non-agricultural use. The proposed Project would have no impact toward conversion of farmland or forest land to non-agricultural or non-forest use

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

3.3 Air Quality

	Potentially Significant Impact	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	[ ]	[ ]	[X]	[ ]
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non- attainment	[ ]	[ ]	[X]	[ ]

under an applicable federal or state ambient air quality standard?				
c) Expose sensitive receptors to substantial pollutant concentrations?	[ ]	[ ]	[X]	[ ]
d) Result in other emissions (such as those leading to odors or adversely affecting a substantial number of people?	[ ]	[ ]	[X]	[ ]

Discussion

The Project area is located within the South Coast Air Basin (SCAB), which is regulated by the South Coast Air Quality Management District (SCAQMD). The SCAQMD monitors air pollutant levels to ensure the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) are met and, if they are not met, to develop strategies to meet the standards. The nearest air monitoring station is located in the Lake Skinner Recreation Area, approximately 11 miles southwest from the proposed Project area (United States Environmental Protection Agency [U.S. EPA] 2024).

The NAAQS, which are required to be set by the U.S. EPA under the Clean Air Act, provide public health protection, including protecting the health of sensitive populations such as asthmatics, children, and the elderly (U.S. EPA 2023). Similarly, the CAAQS are established to protect the health of the most sensitive groups and are mandated by State law. U.S. EPA has set NAAQS for six pollutants, which are called "criteria pollutants:" carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than 10 microns in aerodynamic diameter (PM_{10}), particulate matter less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$), and sulfur dioxide (SO_2). In addition to these, the California Air Resources Board (CARB) has added four criteria pollutants: hydrogen sulfide (H_2S), sulfates (SO_4^{2-}), visibility reducing particles, and vinyl chloride (CARB 2024). In total, CARB has formally identified over 200 substances and groups of substances as toxic air contaminants.

Depending on whether the NAAQS or CAAQS are attained or exceeded, the SCAB is classified as being in "attainment" or "nonattainment." The 2022 Air Quality Management Plan (AQMP; SCAQMD 2022) assesses the attainment status of the SCAB for the NAAQS and CAAQS (See **Table 3-1**). As **Table 3-1** shows, the SCAB is in nonattainment for the State ozone (1-Hour and 8-Hour), PM_{10} (24-Hour and Annual), and $PM_{2.5}$ (Annual) requirements, and for the Federal ozone (1-Hour and 8-Hour), $PM_{2.5}$ (24 hour and Annual), and lead (3-Months Rolling) requirements. Thus, the SCAB is required to implement strategies that would reduce pollutant levels to recognized standards, which is done through the Clean Communities Plan (formerly known as the Air Toxics Control Plan). The Clean Communities Plan is designed to examine the overall direction of the SCAQMD's air toxics control program and includes control strategies aimed at reducing toxic emissions (SCAQMD 2010).

Table 3-1: Criteria Pollutant Attainment Status – SCAB

Criteria Pollutant	Averaging Time	State (CAAQS)	Federal (NAAQS)
Ozone (O_3)	1-Hour	Nonattainment	Nonattainment (extreme)
	8-Hour	Nonattainment	Nonattainment (extreme)
Carbon Monoxide (CO)	1-Hour	Attainment	Attainment (maintenance)
	8-Hour	Attainment	Attainment (maintenance)
Nitrogen Dioxide (NO_2)	1-Hour	Attainment	Unclassifiable/Attainment
	Annual	Attainment	Attainment (maintenance)
Sulfur Dioxide (SO_2)	1-Hour	Attainment	Unclassifiable/Attainment
	24-Hour	Attainment	Unclassifiable/Attainment
Particulate Matter (PM_{10})	24-Hour	Nonattainment	Attainment (maintenance)
	Annual	Nonattainment	No Criteria Defined
Particulate Matter ($PM_{2.5}$)	24-Hour	No Criteria Defined	Nonattainment (serious)
	Annual	Nonattainment	Nonattainment (serious)
Lead (Pb)	30-Day	Attainment	No Criteria Defined
	3-Months Rolling	No Criteria Defined	Nonattainment (partial)
Hydrogen Sulfide (H_2S)	1-Hour	Unclassified/Attainment	No Criteria Defined
Sulfates (SO_4^{2-})	24-Hour	Attainment	No Criteria Defined

Source: SCAQMD 2022

The SCAQMD provides numerical thresholds to analyze the significance of a project's construction and operational emissions on regional air quality. These thresholds are designed such that a project consistent with the thresholds would not have an individually or cumulatively significant impact on the SCAB's air quality. In addition to criteria air pollutants, thresholds have been set for nitrogen oxides (NO_X) and volatile organic compounds (VOCs), also referred to as reactive organic gases (ROG), which are O_3 precursors. These thresholds are listed in **Table 3-2**.

Table 3-2: SCAQMD Air Quality Significance Thresholds

Pollutant	Mass Thresholds (lbs/day)	
	Construction	Operation
Nitrogen Oxides (NO_x)	100	55
Volatile organic compounds (VOC)	75	55
Particulate Matter (PM_{10})	150	150
Particulate Matter ($PM_{2.5}$)	55	55
Sulfur Oxides (SO_x)	150	150
Carbon Monoxide (CO)	550	550
Lead (Pb)	3	3
Toxic Air Contaminants	• Maximum Incremental Cancer Risk $\geq$ 10 in 1 million • Cancer Burden > 0.5 excess cancer cases (in areas $\geq$ 1 in 1 million) • Chronic & Acute Hazard Index $\geq$ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	

Source: SCAQMD 2023

In addition, the SCAQMD has developed localized significance thresholds (LSTs) in response to concern regarding exposure of individuals to criteria pollutants in local communities. LSTs are only applicable to the following criteria pollutants: NO_X, CO, PM_{10} and $PM_{2.5}$. LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area, distance to the nearest sensitive receptor, and project size. For PM_{10} LSTs were derived based on requirements in SCAQMD Rule 403 – Fugitive Dust. For the purposes of a CEQA analysis, the SCAQMD considers a sensitive receptor to be a receptor such as residence, hospital, convalescent facility where it is possible that an individual could remain for 24 hours. The use of LSTs is voluntary, to be implemented at the discretion of local agencies.

The LSTs are defined for 38 source receptor areas (SRAs). The proposed Project is located in source receptor area 28 (SRA-28), Hemet/San Jacinto Valley. LSTs have been developed for emissions within construction areas up to five acres in size. The SCAQMD provides lookup tables for sites that measure up to one, two, or five acres. Although the proposed Project consists of multiple components, the area under active construction at any given time would not be expected to exceed two acres per day. Pursuant to SCAQMD guidance, LSTs for the two-acre site should be used for sites that are greater than one acre and less than or equal to two acres in size. LSTs for construction on two-acre sites in SRA-28 are shown in **Table 3-3**. The SCAQMD defines LSTs as a function of receptor distance (meters) from the boundary of a project site. **Table 3-3** lists LSTs for a receptor distance of 25 meters (82 feet) from the proposed Project, which is the most conservative LST distance (LSTs range from 25 to 500 meters).

Table 3-3: SCAQMD LSTs for Construction and Operation

Pollutant	Allowable emissions (lbs/day) from a two-acre site in SRA-28 for a receptor within 25 meters (82 feet)
Gradual Conversion of NO_x to NO_2	234
CO	1,100
PM_{10} (operation)	2
PM_{10} (construction)	7
$PM_{2.5}$ (operation)	1
$PM_{2.5}$ (construction)	4

Source: SCAQMD 2009

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

The SCAQMD's 2022 AQMP assesses the attainment status of the SCAB, which includes the proposed Project area, and provides a strategy for attainment of State and federal air quality standards (SCAQMD 2022). The AQMP strategies are developed based on population, housing, and employment growth forecasts anticipated under local city general plans and the Southern California Association of Government (SCAG)'s 2020 Regional Transportation Plan/Sustainable Communities Strategy, referred to as Connect SoCal (SCAG 2020).

A project would conflict with or obstruct an applicable air quality plan If it would lead to population, housing or employment growth that exceeds the forecasts used in the development of the applicable air quality plan.

The overall objectives of the Project are to correct existing and future hydraulic deficiencies of existing facilities; design a replacement pump station that minimizes potential for local hazards, such as vandalism, wildfire, flooding, and limited site access; continue to provide potable water supply to existing connections; and properly abandon facilities that would no longer be in use. The proposed Project would improve operational benefits to accommodate existing and planned demand for water conveyance in EMWD's service area that would occur with or without the Project. Construction would not require personnel to relocate from outside the area; jobs would be filled by local workers. The proposed Project would not lead to unplanned population, housing or employment growth that exceeds the forecasts used in the development of the AQMP. Potential conflicts with the AQMP would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

Proposed Project emissions of criteria air pollutants were estimated using the California Emissions Estimator Model (CalEEMod) 2022.1.1.21, which is used throughout California to quantify criteria pollutant emissions. The CalEEMod estimations were based on Project-specific information, found in *Section 2 Project Description*. In instances where Project-specific information was not available (e.g., construction equipment horsepower, length of worker trips, soil moisture content), the analysis relied on CalEEMod default values. As explained in *Section 2.4.6 Construction Schedule*, it is assumed that construction would begin in August 2024 and have a duration of approximately 18 months. The model also assumes compliance with SCAQMD's Rule 403 (Fugitive Dust) which requires construction projects to implement measures to suppress fugitive dust emissions, such as watering of exposed soils, limiting vehicle speeds on unpaved areas, and covering haul trucks. The complete CalEEMod Air Quality Data Sheets are provided in **Appendix A**.

Construction Emissions

Construction of the proposed Project would result in air emissions of criteria pollutants from short-term construction activities including the use of construction equipment with internal combustion engines, and offsite vehicles to transport workers, deliver materials to the site, and haul import and export material to and from the site. Project construction would also result in fugitive dust emissions, which would be lessened through the implementation of the fugitive dust control measures required by SCAQMD Rule 403.

Table 3-4 summarizes the maximum daily pollutant emissions during construction of the proposed Project. As shown in **Table 3-4**, the maximum daily emissions generated during construction of the proposed Project would not exceed SCAQMD regional thresholds for any criteria pollutant. Therefore, impacts associated with construction of the proposed Project would be less than significant.

Table 3-4: Maximum Daily Construction Emissions Compared to SCAQMD Regional Thresholds

Emissions Source	ROG[1]	NO_x[1]	CO[1]	SO_x[1]	PM_{10}[1]	$PM_{2.5}$[1]
Total onsite and mobile sources	5.82	47.5	57.3	0.11	2.53	1.90
SCAQMD Regional Thresholds	*75*	*100*	*550*	*150*	*150*	*55*
Threshold exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

[1]Units are lbs/day

Notes: Emissions represent the maximum of winter or summer and are rounded to the nearest whole number. In CalEEMod, EMWD's standard construction practices , including measures to control fugitive dust, must be input as "mitigation measures." Therefore, these results reflect the mitigated scenario in the output tables in Appendix A.

Operation Emissions

Operation of the proposed Project would not result in an increase in emissions of criteria pollutants because the energy consumption of the Mission Canyon II replacement pump station would be the same as the existing Mission Canyon II Pump Station, and operation of the new pipelines would not be associated with long-term energy usage. Inspection of the replacement pump station and pipelines would be incorporated into EMWD's existing O&M activities and would not require additional EMWD O&M activities. The demolished pump station and abandoned pipeline would not be associated with long-term energy use. Therefore, impacts associated with operation of the proposed Project would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

c) Expose sensitive receptors to substantial pollutant concentrations?

Sensitive receptors are typically defined as schools (preschool–12th grade), hospitals, resident care facilities, senior housing facilities, day care centers, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality (CARB 2018). Sensitive receptors within one-half mile of the proposed Project consist of single-family and multi-family residences.

LSTs represent the maximum emissions from a project that will not cause or contribute to an air quality exceedance of the most stringent applicable federal or State ambient air quality standard at the nearest sensitive receptor. The CAAQS and NAAQS provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. If a project is consistent with the latest adopted clean air plan and does not exceed the SCAQMD significance thresholds, it can be assumed that it will not have a substantial adverse impact on public health. Therefore, projects that conform to the LSTs and SCAQMD regional thresholds are assumed to have a less than significant impact on nearby sensitive receptors.

LSTs are only applicable to emissions within a fixed, stationary location, such as construction sites, and vary based on project site size. As explained under the discussion above, SCAQMD provides LST lookup tables for sites that measure up to one, two, or five acres; LSTs for construction sites greater than one acre but less than or equal to two-acres should use the two-acre threshold. While the use of LSTs is voluntary, **Table 3-5** provides the maximum daily emissions generated during construction of the proposed Project compared to LSTs for the Project area.

Table 3-5: Maximum Daily Construction Emissions Compared to Localized Significance Thresholds

Emissions Source	NO_x[1]	CO[1]	$PM_{2.5}$[1]	PM_{10}[1]
Total onsite sources	47.5	57.3	1.90	2.53
Localized Significance Threshold (one-acre, 25 meters)	*234*	*1,100*	*4*	*7*
Threshold exceeded?	**No**	**No**	**No**	**No**

[1]Units are lbs/day

As shown in **Table 3-5**, construction of the proposed Project would not have a significant air pollution impact on sensitive receptors. As discussed under "b" above, operation of the proposed Project would not result in an increase in emissions of criteria air pollutants. Furthermore, as discussed under "b" above, the construction and operational emissions would not exceed SCAQMD regional thresholds. Therefore, sensitive receptors would not be subjected to substantial pollutant concentrations and impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

The proposed Project would involve emissions of sulfur compounds from use of oil and diesel fuel during construction, which would potentially result in unpleasant odors. Construction would be temporary and odorous emissions from construction equipment tend to dissipate quickly within short distances from construction sites. Construction of the new pipelines would be the closest to sensitive receptors but would progress at a rate of approximately 50 linear feet per day, so impacts would not occur in the same area over the entire construction period, further limiting the time a stationary receptor may experience odors. Construction of the Mission Canyon II replacement pump station would occur within the same location for the duration of construction, however, there is only one residence located within a 25-meter (82-foot) radius of the replacement pump station site that could experience temporary impacts. Once the proposed Project is operational, the below-ground pipelines would not be associated with odors, and the replacement pump station would only use the onsite diesel generator during emergencies or monthly maintenance. Impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

3.4 Biological Resources

Would the Project:	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
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 U.S. Fish and Wildlife Service?	[ ]	[X]	[ ]	[ ]
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	[ ]	[X]	[ ]	[ ]
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	[ ]	[ ]	[X]	[ ]

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

Discussion

A Biological Resources Assessment (BRA) was prepared for the proposed Project in February 2024 by Rincon Consultants. The BRA included a review of aerial imagery, publicly available literature, a jurisdictional delineation, and field reconnaissance surveys. The BRA Study Area includes the footprint of each Project component (Project Area) plus a 100-foot buffer, and is shown in **Figure 3-3**. The complete report is provided in **Appendix B** and is relied upon for the analysis in this MND.

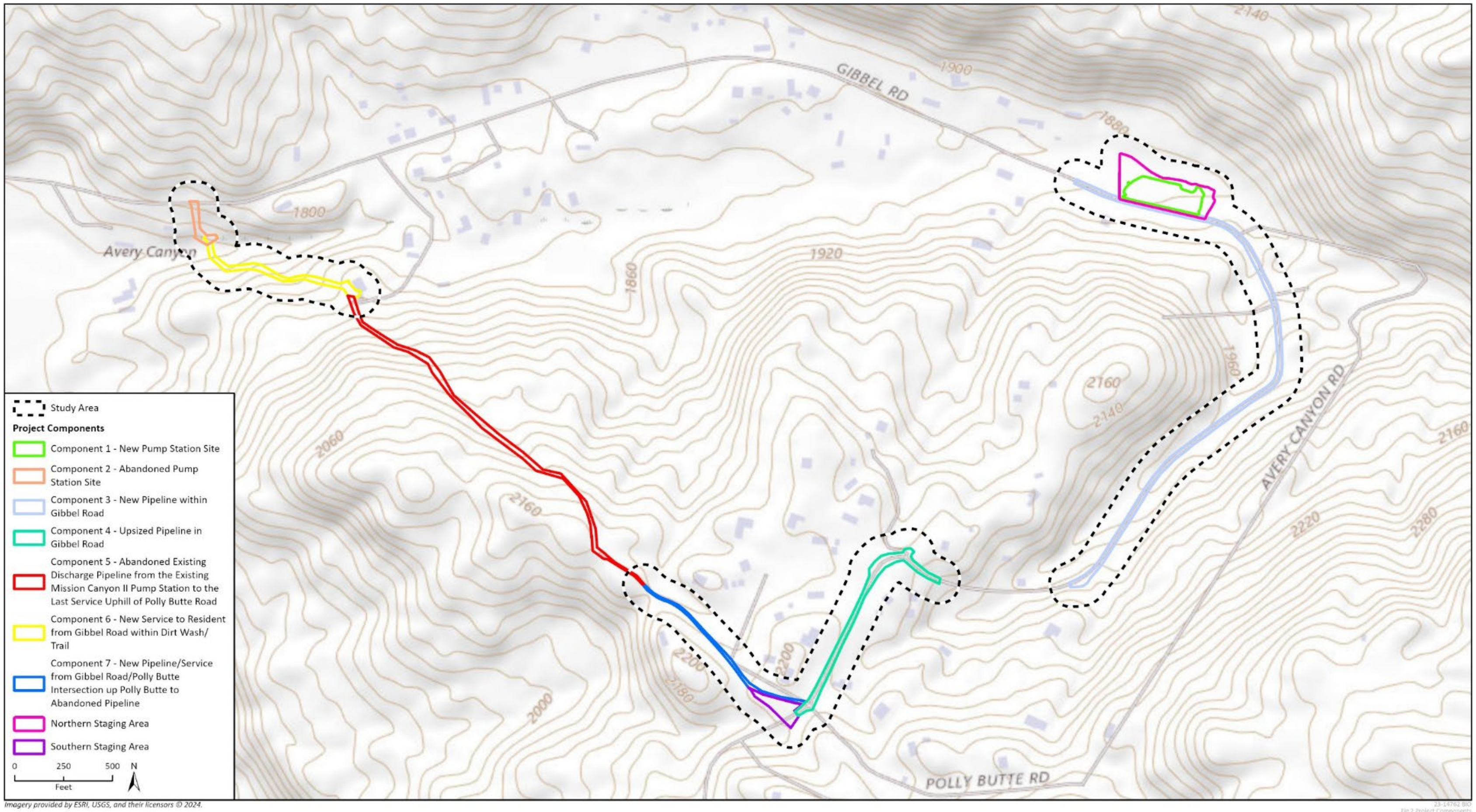
Regulated or sensitive resources studied and analyzed included special status plant and wildlife species, nesting birds and raptors, wildlife movement corridors and habitat linkages, sensitive plant communities, jurisdictional waters and wetlands, and locally protected resources (i.e., trees). Potential impacts to biological resources were analyzed based on the following statutes:

- Federal Endangered Species Act (FESA)
- Federal Clean Water Act (CWA)
- California Endangered Species Act (CESA)
- California Environmental Quality Act (CEQA)

- California Fish and Game Code (CFGC)
- Migratory Bird Treaty Act (MBTA)
- Bald and Golden Eagle Protection Act
- Porter-Cologne Water Quality Control Act
- Riverside County Municipal Code

The literature review consisted of publicly available spatial data from a variety of public agencies, geospatial warehouses, aerial imagery, and previously written reports related to the proposed Project Area and surrounding U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map. A field reconnaissance survey was conducted on foot between 8:00 am to 4:00 pm on September 21, 2023, within the Study Area of the Project components (1-4 and 6-7) to characterize the existing conditions and to the investigate the presence, or potential presence, of special-status plant and wildlife species, sensitive plant communities, jurisdictional waters and wetlands, wildlife migration and movement corridors, locally protected resources, and nesting bird habitat. The area associated with abandonment of the 6-inch discharge pipeline (component 5) was neither surveyed nor assessed for biological resources since there would be no ground disturbance in association with the pipeline abandonment. A formal jurisdictional delineation was conducted within the Mission Canyon II pump station replacement site (component 1) of the Study Area in October 2023 by ELMT Consulting, Inc. The complete *Delineation of State and Federal Jurisdictional Waters* report is provided in **Appendix C**.

Figure 3-3: Biological Resource Assessment Study Area



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 U.S. Fish and Wildlife Service?

Results of the field survey identified 13 vegetation communities and land cover types in the Study Area. One of the native vegetation communities, California Sycamore-Coast Live Oak Riparian Woodland is considered a CDFW Sensitive Natural Community. Other native vegetation communities include Brittle Brush Scrub, California Buckwheat Scrub, Coast Live Oak Woodland, Wild Oats and Annual Brome Grassland, Disturbed Mulefat Thickets, and Disturbed Yerba Santa Scrub. **Figures 3-4a**, **3-4b**, **3-4c**, **3-4d**, and **3-4e** show vegetation communities in the Study Area of each Project component.

Figure 3-4a: Vegetation Communities and Land Cover Types

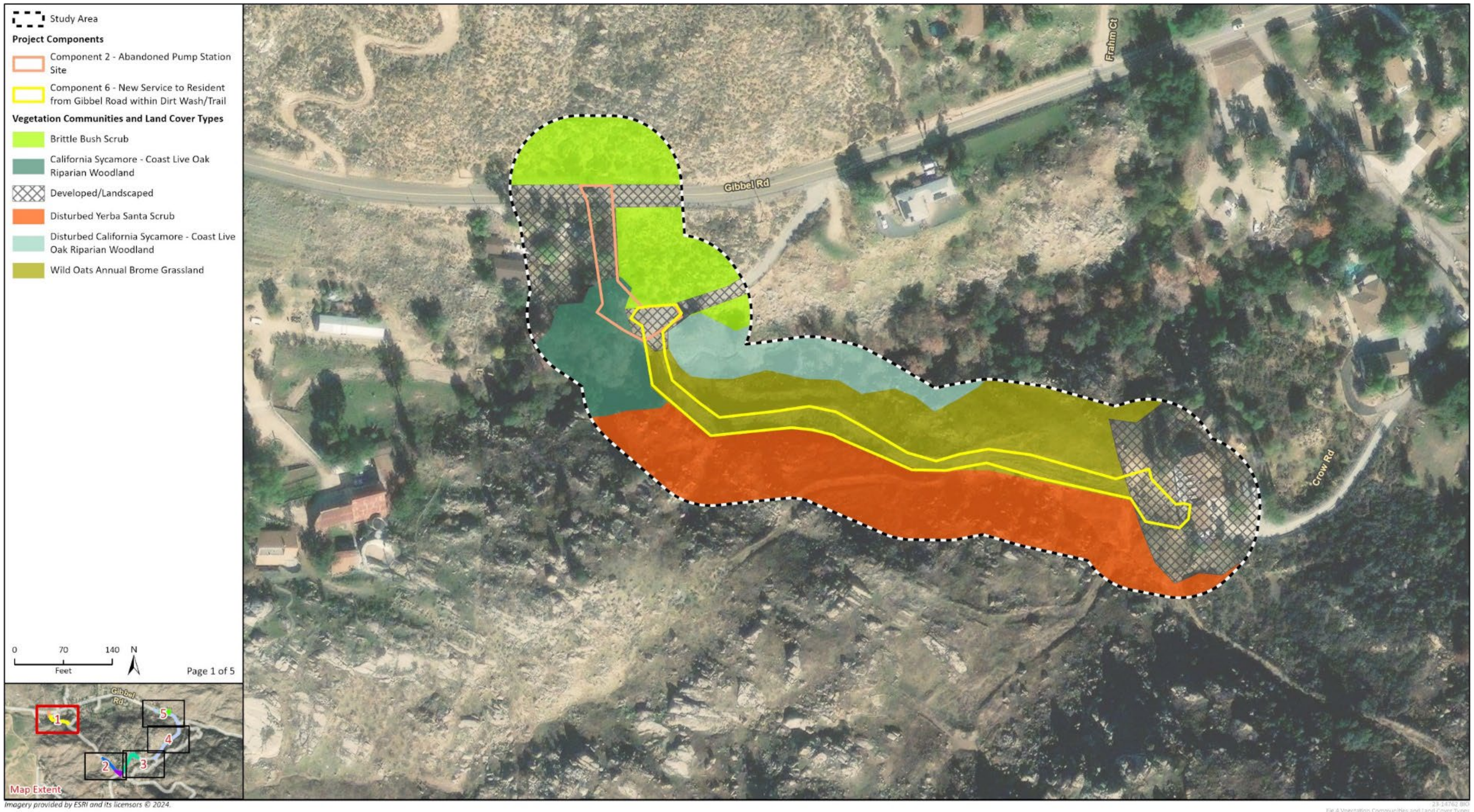


Figure 3-5b: Vegetation Communities and Land Cover Types

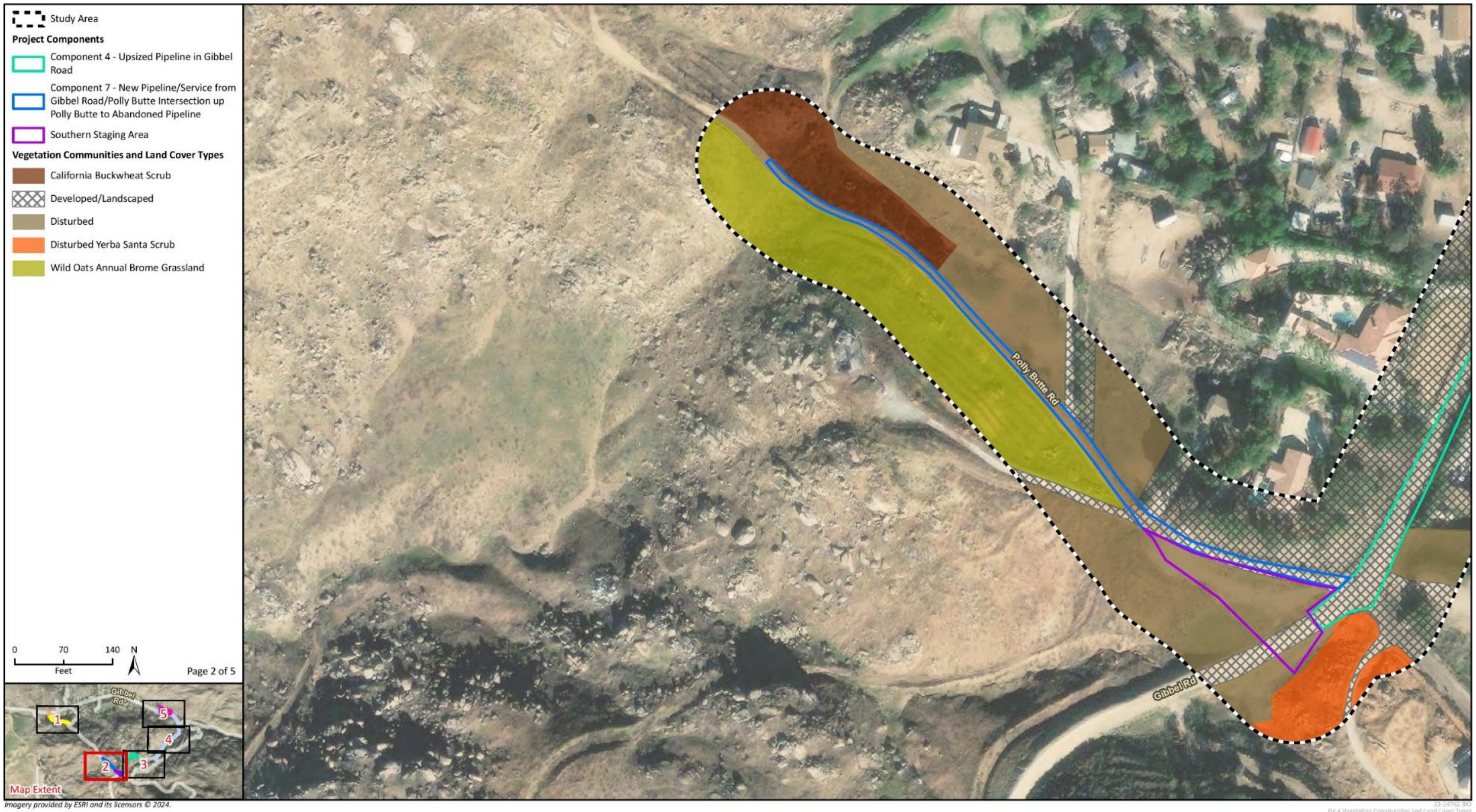


Figure 3-6c: Vegetation Communities and Land Cover Types

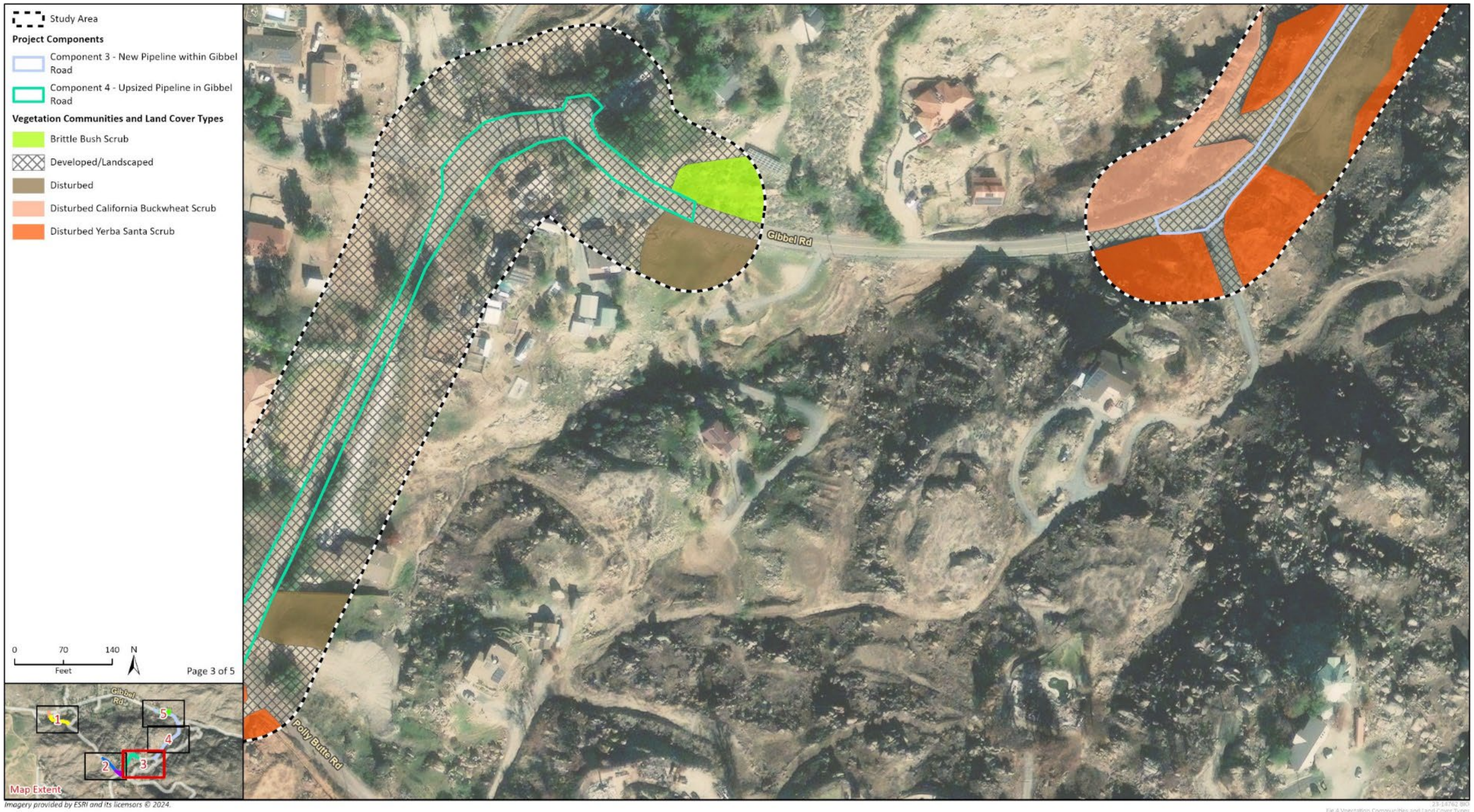


Figure 3-7d: Vegetation Communities and Land Cover Types

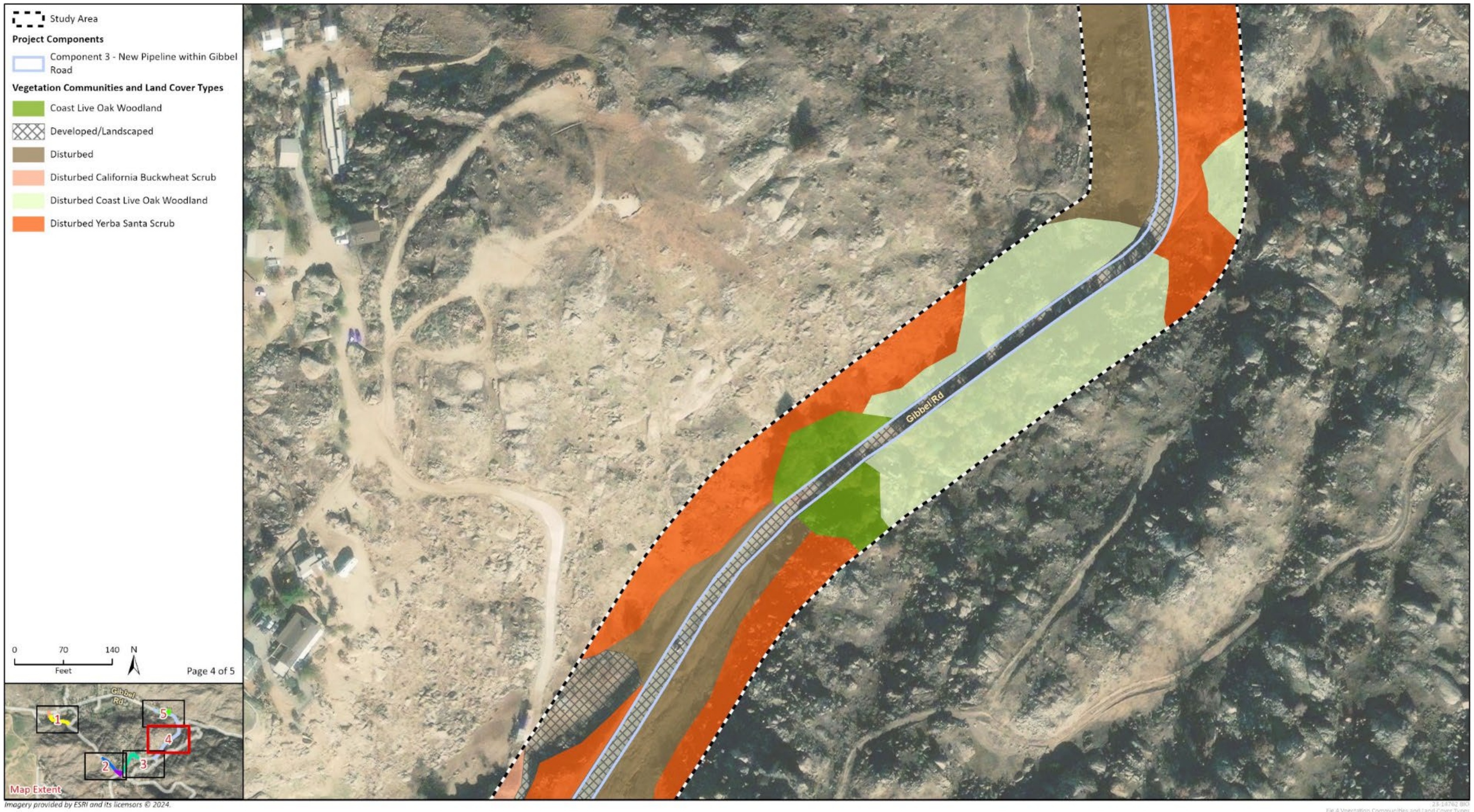
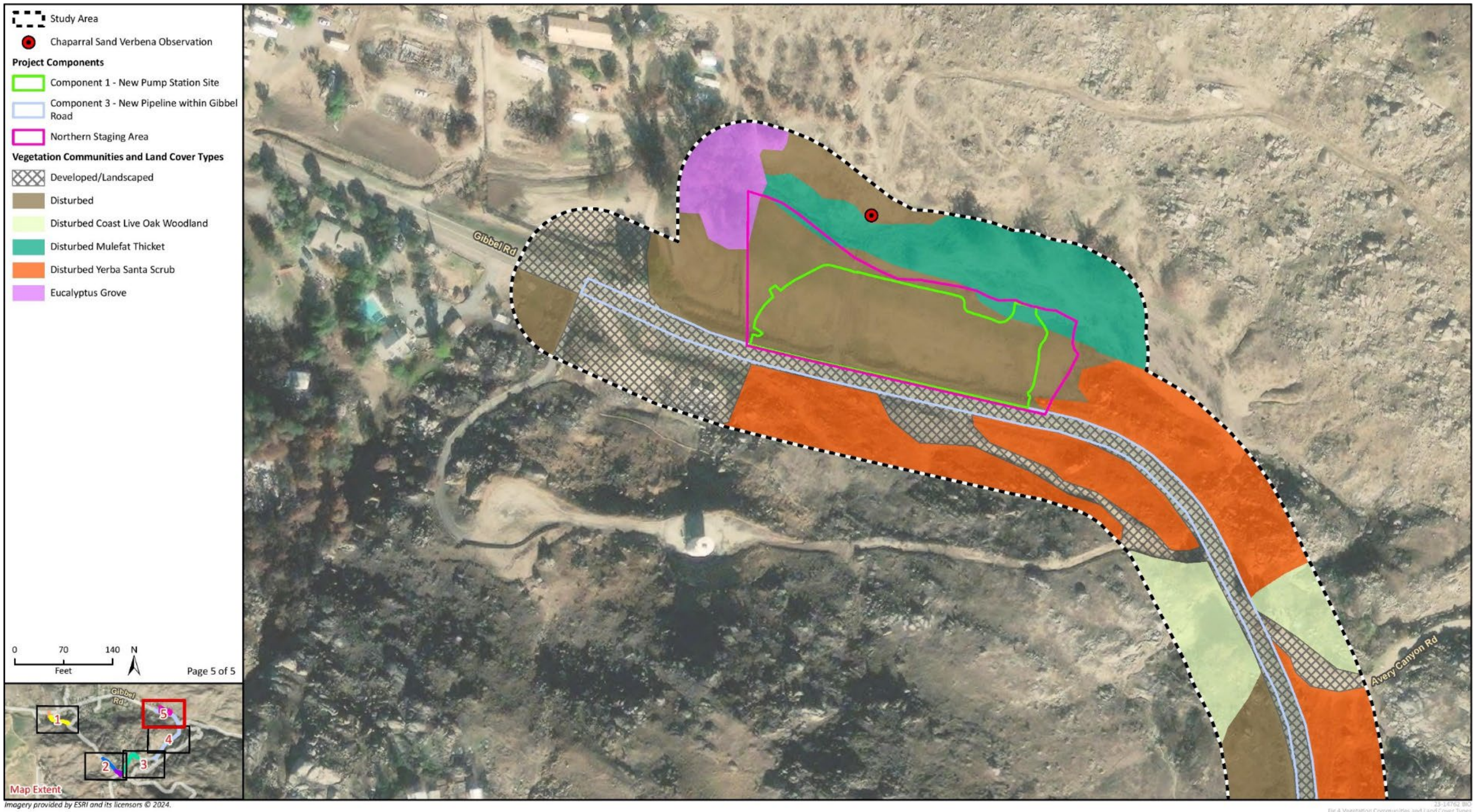


Figure 3-8e: Vegetation Communities and Land Cover Types



The literature and database review identified 86 special-status plant and animal species in the vicinity of the Study Area. Of these 86 species, one plant species was observed, and 32 species (13 plants and 19 animals) are considered to have some potential to occur in the Study Area. Each of these 33 special-status species, its listing or rarity status, and its potential to occur is included in **Table 3-6**. No federally designated critical habitat is located within the Study Area. Native and ornamental trees, snags, coastal scrub, rocky outcroppings, buildings, and grasslands within the Study Area provide suitable nesting bird habitat.

Table 3-6: Special-Status Species with Potential to Occur within the Study Area

Scientific Name	Common Name	Status[1]	Potential to Occur
Plants			
Abronia villosa var. *aurita*	Chaparral sand-verbena	CRPR 1B.1	Present
Astragalus pachypus var. *jaegeri*	Jaeger's milk-vetch	CRPR 1B.1	Moderate
Calochortus weedii var. *intermedius*	Intermediate mariposa-lily	CRPR 1B.2	Low
Chorizanthe parryi var. *parryi*	Parry's spineflower	CRPR 1B.1	High
Chorizanthe polygonoides var. *longispina*	Long-spined spineflower	CRPR 1B.2	Low
Chorizanthe xanti var. leucotheca	White-bracted spineflower	CRPR 1B.2	Moderate
Deinandra mohavensis	Mojave tarplant	SE; CRPR 1B.3	High
Dodecahema leptoceras	Slender-horned spineflower	FE; SE; CRPR 1B.1	Moderate
Imperata brevifolia	California satintail	CRPR 2B.1	Low
Nama stenocarpa	Mud nama	CRPR 2B.2	Low
Pseudognaphalium leucocephalum	White rabbit-tobacco	CRPR 2B.2	Low
Saltugilia latimeri	Latimer's woodland-gilia	CRPR 1B.2	Low
Symphyotrichum defoliatum	San Bernardino aster	CRPR 1B.2	Low
Tortula californica	California screw moss	CRPR 1B.2	Low
Invertebrates			
Bombus crotchii	Crotch's bumble bee	SCE	High
Euphydryas editha quino	Quino checkerspot butterfly	FE	Low
Amphibians			
Spea hammondii	Western spadefoot toad	FCT; SSC	Low
Reptiles			
Anniella stebbinsi	Southern California legless lizard	SSC	Moderate

Scientific Name	Common Name	Status[1]	Potential to Occur
Arizona elegans occidentalis	California glossy snake	SSC	Moderate
Aspidoscelis tigris stejnegeri	Coastal whiptail	SSC	Moderate
Coleonyx variegatus abbotti	San Diego banded gecko	SSC	Low
Crotalus ruber	Red-diamond rattlesnake	SSC	Moderate
Phrynosoma blainvillii	Coast horned lizard	SSC	Moderate
Salvadora hexalepis virgultea	Coast patch-nosed snake	SSC	Low
Birds			
Aquila chrysaetos	Golden eagle	FP	Low
Lanius ludovicianus	Loggerhead shrike	SSC	Low
Polioptila californica californica	Coastal California gnatcatcher	FT; SSC	Moderate
Setophaga petechia	Yellow warbler	SSC	Low
Mammals			
Antrozous pallidus	Pallid bat	SSC	Low (roosting) Moderate (foraging)
Chaetodipus fallax fallax	Northwestern San Diego pocket mouse	SSC	High
Lasiurus xanthinus	Western yellow bat	SSC	Low
Neotoma lepida intermedia	San Diego desert woodrat	SSC	Moderate
Perognathus longimembris brevinasus	Los Angeles pocket mouse	SSC	Low

[1] FE = Federally Endangered FCT = Federal Candidate Threatened FP = State Fully Protected
FT = Federally Threatened SCE = State Candidate Endangered SE = State Endangered
SSC = CDFW Species of Special Concern

Special Status Plant Species

Six special-status plant species (Chaparral sand-verbena, Jaeger's milk-vetch, Parry's spineflower, White-bracted spineflower, Mojave tarplant, and Slender-horned spineflower) are present or have a high or moderate potential to occur within the Study Area (**Table 3-6).** Direct impacts during vegetation removal and grading activities could result in mortality to these special status plant species if they are present in the suitable disturbed mulefat thicket within the Project site of the Mission Canyon II replacement pump station (component 1) and northern staging area, as well as in the wild oats and annual brome grassland within the Project site of component 6 (1,050 LF of 2-inch service line from the existing 6-inch pipeline along Gibbel Road to 40751 Gibbel Road).

Additionally, indirect impacts could occur if the special status plant species are present within the Project Area and/or Study Area through habitat modification resulting from the introduction of invasive plants during construction. Potential impacts to these species would be avoided and/or reduced to less than significant through implementation of **Mitigation Measure BIO-1** which requires Special Status Plant Surveys and QCB Host Plant Surveys. Based on the results of the special-status plant surveys recommended in **Mitigation Measure BIO-1**, potential impacts to special-status plant species would be avoided or mitigated through the implementation of **Mitigation Measure BIO-2**, which requires worker environmental awareness training; **Mitigation Measure BIO-3** which requires implantation of measures to control invasive plant species; **Mitigation Measure BIO-4,** which requires on-site monitoring by a biologist to oversee and make recommendations on avoidance of sensitive species during vegetation removal and grading; and **Mitigation Measure BIO-5** which requires workers to implement general best management practices at the site, or found to be less than significant without the need for additional mitigation. In addition, if a CESA listed plant species is detected within the Project Area and cannot be avoided, consultation with the CDFW and obtainment of a CESA Incidental Take Permit would be required.

Special Status Wildlife Species

Seven of the terrestrial wildlife species are CDFW Species of Special Concern (SSC) and include the Southern California legless lizard, California glossy snake, coastal whiptail, red-diamond rattlesnake, coast horned lizard, northwestern San Diego pocket mouse, and San Diego desert woodrat (**Table 3-6**). Direct impacts to these special-status wildlife species could occur through trampling if foraging, burrowing, or estivating individuals are present within suitable habitat in the Project Area or intermittently move into the Project Area from suitable habitat during construction. Impacts to these non-listed species would be considered significant under CEQA if they jeopardize the viability of a local or regional population. Given the overall small Project footprint and limited impacts to potentially suitable habitat, the Project is unlikely to result in population-level impacts to these species. In addition, the presence of the extensive areas of suitable habitat surrounding the Study Area will continue to have the ability support robust populations of these species following construction. Therefore, the Project does not have the potential to jeopardize the continued existence of the regional populations of these species.

Impacts to day roosts or maternal roosts of pallid bat, a CDFW SSC, are not anticipated since this species is unlikely to roost within the Study Area. Additionally, impacts are not anticipated to foraging individuals since this species is nocturnal and construction would take place during the day.

Impacts to nesting golden eagle, a State Fully Protected (FP) species, are not anticipated since the species is unlikely to nest within the immediate vicinity of the Project Area.

Additionally, impacts are not anticipated to foraging individuals since this species is highly mobile and there is an ample amount of higher quality foraging habitat located outside of the Study Area.

The Crotch's Bumble Bee, a State Candidate Endangered (SCE) species, is an aerially mobile species and foraging individuals are unlikely to be impacted during construction. However, impacts to this species may occur through trampling if burrowing or nesting individuals are present within suitable wild oats and annual brome grassland or disturbed mulefat thickets within the Component 1 and 6 Project Areas and the northern staging area during construction. Impacts to Crotch's Bumble Bee would be avoided or minimized with the implementation of **Mitigation Measure BIO-2** which requires construction site Worker Environmental Awareness Training, **Mitigation Measure BIO-4** which requires on-site monitoring by a biologist to oversee and make recommendations on avoidance during vegetation removal and grading, and **Mitigation Measure BIO-6** which requires focused Crotch Bumble Bee Surveys. If an active colony of Crotch Bumble Bees is observed within the Study Area during the focused surveys conducted as part of **Mitigation Measure BIO-6**, consultation with the CDFW and a CESA Incidental Take Permit along with mitigation would be necessary prior to Project implementation.

The Quino Checkerspot Butterfly (QCB), a Federally Endangered (FE) species is an aerially mobile species in its mature stage and foraging individuals are unlikely to be impacted during construction. However, direct impacts are likely to occur if eggs, larvae, or pupae are present within suitable disturbed mulefat thicket habitat within the Project Area of the Mission Canyon II replacement pump station site (component 1) and northern staging area, or if they are present within the suitable wild oats and annual brome grassland within the component 6 Project Area (1,050 LF of 2-inch service line from the existing 6-inch pipeline along Gibbel Road to 40751 Gibbel Road) during construction through host plant damage or removal. Additionally, indirect impacts may occur if unoccupied host plants are removed through a reduction in suitable ovipositing habitat. Impacts to QCB would be avoided or minimized through the implementation of **Mitigation Measure BIO-1** which requires surveys for QCB host plants to determine presence or absence and mapping of the species, **Mitigation Measure BIO-2**, which requires construction site Worker Environmental Awareness Training, **Mitigation Measure BIO-4** which requires on-site monitoring by a biologist to oversee and make recommendations on avoidance during vegetation removal and grading, and **Mitigation Measure BIO-7** which requires QCB surveys. If QCB individuals are determined to be present within the Study Area, consultation with the USFWS would be required and an Incidental Take Permit or Statement along with mitigation will be necessary prior to Project implementation.

Suitable habitat for coastal California gnatcatcher, a Federally Threatened species and CDFW SSC, is not located within the Project Area; therefore, impacts to this species foraging and nesting habitat are not anticipated. However, Project-related impacts to this species could occur if an active nest is present within suitable nesting habitat and is abandoned due to Project-related disturbance. Suitable nesting habitat can be found in the brittle bush scrub, California buckwheat scrub, and disturbed yerba santa scrub adjacent to the Project Area of all Project components as well as the northern and southern staging areas. Impacts would be avoided or mitigated through the implementation of **Mitigation Measure BIO-2** which requires construction site Worker Environmental Awareness Training, and **Mitigation Measure BIO-8** which requires avoidance and/or minimization measures to reduce impacts to coastal California gnatcatcher.

Multiple species of birds protected by the Migratory Bird Treaty Act, and raptors protected under California Fish and Game Code Section 3503 have the potential to nest throughout the Study Area. Direct impacts to these species could occur if active nests are present within the vegetation communities during their removal. Direct impacts would also occur if active nests are located within close vicinity to the Project Area and are abandoned due to visual and acoustic Project-related disturbance. Indirect impacts could result from the increase in noise and human presence if active nests are within the vicinity of construction and this disturbance could result in nest failure. Indirect impacts could also include habitat modifications by the introduction of invasive plants from construction equipment, resulting in loss of cover and foraging opportunities. Potential direct and indirect impacts to these species would be avoided or mitigated with implementation of **Mitigation Measure BIO-2** which requires construction site worker environmental awareness training, and **Mitigation Measure BIO-9** which requires pre-construction nesting bird surveys and establishment of buffers if needed to avoid nests.

Indirect impacts could occur to all special status wildlife species with a potential to occur due to noise and dust generation during heavy equipment operation and through habitat loss due to the introduction of invasive plants. Potential indirect impacts to special-status wildlife species would be avoided or mitigated through the implementation of **Mitigation Measure BIO-2**, which requires Worker Environmental Awareness Training, **Mitigation Measure BIO-3**, which requires control of invasive plants and **Mitigation Measure BIO-5** which requires general construction site best management practices.

Mitigation Measures

BIO-1: Special-Status and Quino Checkerspot Butterfly Host Plant Surveys. Focused special-status plant surveys shall be conducted to verify the presence or absence, estimate the abundance, and map the extent of the six special-status plant species that are present or have a high or moderate potential to occur within the Component 1 and 6 Project Areas and the northern staging area. The special-status plant survey should also involve a search for the host plants of QCB. The results of the survey will be used to determine if the Project has the potential to impact these special-status plant species and/or QCB. The surveys should be conducted within the plants' most distinct phenology period to correctly identify the species and in accordance with guidelines published by the USFWS (2000), CDFW (2018), and CNPS (2001). This window is typically during the flowering phase. Based on the phenology of the six species with a potential to occur (chaparral sand-verbena, Jaeger's milk-vetch, Parry's spineflower, white-bracted spineflower, Mojave tarplant, and slender-horned spineflower) and the QCB host plants (California plantain, wooly plantain, and owl's clover), the surveys shall be conducted in April and June.

If special-status plant species or QCB host plants are detected within the Project Area, the limits of their distribution shall be flagged. Flagging shall extend to the further extent within the Project Area, but outside any private property. Special-status plant species and QCB host plants shall be monitored for avoidance in accordance with avoidance and minimization measure BIO-4 to the maximum extent feasible. Impacts to special-status plant species and their occupied habitat that cannot be feasibly avoided will be minimized by salvaging the top eight inches of their occupied habitats topsoil. Salvaged topsoil will be spread at the same location following construction within temporarily impacted areas or to suitable habitat on-site for areas with permanent impacts. All topsoil salvaging and spreading operations will be overseen by a qualified botanist or restoration ecologist. If the avoidance of impacts to QCB host plants is not feasible, BIO-7 shall be implemented to determine the presence of this species.

BIO-2 Worker Environmental Awareness Training. Prior to the initiation of the Project, an approved biologist shall present a Worker Environmental Awareness Training (WEAT) to all on-site personnel. The WEAT will educate the personnel on the identification of special-status species and regulated biological resources that are present or have the potential to occur within the Project Area, will cover the applicable regulatory policies and provisions regarding their protection, and will provide an overview of the Project's mitigation measures. Furthermore, on-site personnel will be briefed on the reporting process if an inadvertent injury or mortality should occur to a special-status species during construction.

BIO-3 Invasive Plant Species Control. Invasive plant species, for the purpose of this document, shall include all species with a California Invasive Plant Council (Cal-IPC) rating of limited, moderate, or high. Construction personnel and equipment shall be free of invasive plant seeds, propagules, and any material which may contain them (e.g., soil) prior to entering the Project Area. All potentially contaminated equipment will be carefully cleaned prior to the initiation of Project activities. Staging areas and temporary Project Areas shall avoid weed infestations and infestations within the Project Area(s) shall be flagged and avoided to the maximum extent feasible. Only certified weed-free materials (e.g., gravel, straw, and fill) shall be used for the Project.

BIO-4 Biological Monitoring. A qualified biologist shall be on site if special-status plant species, Crotch's bumble bee nest(s), and/or occupied QCB habitat/host plants are determined to be present within 50 feet of the Project Area and can be avoided. The biologist shall be on site during all vegetation removal or grading activities within 50 feet of these regulated biological resources. The biologist will oversee and provide recommendations to facilitate avoidance of these regulated biological resources and will have the authority to temporarily halt work to protect them.

BIO-5 General Best Management Practices. General requirements that shall be followed by construction personnel are listed below.

- The contractor shall clearly delineate the Project limits, staging areas, and access points and prohibit any construction-related traffic outside of these boundaries.
- All food-related trash items, such as wrappers, cans, bottles, and food scraps generated during proposed Project construction, shall be disposed of in closed containers only and removed from the workspace.
- Best management practices (BMPs) shall be implemented throughout the Project and shall include, but not be limited to, erosion and sediment controls to minimize erosion during construction. BMPs shall be implemented for the duration of the Project until disturbed areas have been stabilized by long-term erosion control measures.
- Materials shall be stored at least 50 feet from streams and wetlands, as feasible, or equipment will utilize secondary containment.

- Construction materials and spoils shall be protected from stormwater runoff using temporary perimeter sediment barriers such as berms, silt fences, fiber rolls, covers, sand/gravel bags, and straw bale barriers, as appropriate.
- Vegetation trimming shall be limited to the maximum extent feasible.
- Any substances that could be hazardous to wildlife resulting from Project-related activities shall be prevented from contaminating the soil and/or entering waterways.
- Construction shall only take place during daylight hours.

BIO-6: Focused Crotch Bumble Bee Surveys. Focused Crotch bumble bee surveys shall be conducted within the Component 1 and 6 Project Areas and the northern staging area per the Survey Considerations for CESA Candidate Bumble Bee Species (CDFW 2023d). Foraging bumble bee surveys shall be conducted during this species' flight season (i.e., typically between May to September) to determine the presence or absence of this species within the Project Area. If this species is detected foraging within or adjacent to the Project Area, nesting surveys shall be conducted to identify active colonies. If an active colony is observed within the Project Area (to the furthest extent of the Project Area but outside any private property), the nest shall be relocated to suitable habitat outside of the Project Area. If an active nest is observed within the Project Area, the nest shall be monitored by a qualified biologist in accordance with **Mitigation Measure BIO-4.**

BIO-7: Focused QCB Surveys. If detected and avoidance of QCB host plants is not feasible (as specified in **Mitigation Measure BIO-1**), focused QCB surveys shall be conducted prior to project initiation to determine the presence or absence of this species in all areas QCB host plants are detected. The surveys shall be conducted in accordance with the Survey Guidelines for Quino Checkerspot Butterfly (USFWS 2014). The guidelines state that the surveys shall be conducted weekly by a Section 10(A)(1)(a) recovery permit holder and shall begin on the third week of February and end the second Saturday in May, unless an individual of the species is detected during any survey within the first five weeks.

If QCB host plants are present within the Project site and QCB presence is confirmed during the focused surveys, suitable QCB habitat should be avoided. If avoidance is not feasible, consultation with the USFWS shall occur regarding 'take' of occupied QCB habitat. Host plants shall be relocated to suitable habitat outside of the Project Area by a qualified biologist prior to the commencement of construction.

BIO-8: Coastal California Gnatcatcher Avoidance and Minimization. Measures required during Project construction to avoid and/or minimize impacts to coastal California gnatcatcher include:

- All brushing, grading, or excavation within the Project Areas of component 1 (proposed Mission Canyon II Pump Station) and component 6 (installation of 1,050 LF of 2-inch service line from the existing 6-inch pipeline along Gibbel Road to 40751 Gibbel Road) and the northern staging that occurs adjacent to California gnatcatcher occupied habitat (defined as within 500 feet of any gnatcatcher sightings [USFWS 2007]) shall be conducted from September 1 through February 14, which is outside the coastal California gnatcatcher breeding season.
- When conducting any other construction activities during the coastal California gnatcatcher breeding season of February 15 through August 30, adjacent to habitat in which coastal California gnatcatcher are known to occur or have potential to occur (within 500 feet of suitable scrub habitat), the following avoidance measures shall apply:
    - A USFWS-permitted biologist shall survey for coastal California gnatcatcher within 10 calendar days prior to initiating activities in an area. If coastal California gnatcatcher are present, but not nesting, a USFWS permittee biologist shall survey for nesting coastal California gnatcatcher approximately once per week within 500 feet of the construction area, where accessible, for the duration of the activity in that area during the breeding season. The standard California gnatcatcher survey protocol shall be followed for all surveys.
    - If an active nest is located, a 500-foot no-construction buffer shall be established around each nest site; however, there may be a reduction of this buffer zone depending on site-specific conditions such as topography, line-of-sight to the nest, or the existing ambient level of activity at the discretion of the qualified biologist. No construction shall take place within this buffer until the nest is no longer active.

BIO-9 Pre-construction Nesting Bird Surveys. To avoid disturbance of nesting birds, including special-status species and birds protected by the MBTA and CFGC Section 3503, Project activities shall occur outside of the breeding season for nesting birds (generally February 1 through August 31), if feasible.

If construction occurs during the breeding season, then a pre-construction nesting bird survey shall be conducted no more than seven days prior to the initiation of Project activities. The nesting bird survey shall be conducted on foot inside the Project Area and include a 500-foot buffer for raptors and special-status species a 100-foot buffer for all other species. The survey shall be conducted by a biologist familiar with avian species known to inhabit Southern California. If nests are found, an avoidance buffer of up to 500 feet for raptors and special-status species and up to 100 feet for non-raptors (dependent upon the species, the proposed work activity, and existing disturbances associated with land use outside of the workspace) shall be determined and demarcated by the biologist with construction fencing, flagging, or other means to mark the boundary. Intrusion into the buffer may be conducted if it is determined by the biologist that there is no risk of harm to the nest and work is monitored by the biologist. If the risk of nest abandonment is observed, all construction activities within the buffer shall cease until the nest is no longer active as determined by the biologist.

Significance Determination

Less than significant impact with mitigation incorporated.

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

The canopy of the California sycamore – coast live oak riparian woodland overhangs into the Project Area of the existing Mission Canyon II Pump Station to be removed (component 2); however, the understory is comprised of bare ground, non-native annual grasses, and developed land and no trees in this community would be removed as a part of the Project. Therefore, no direct impacts to riparian habitat or sensitive natural communities are anticipated. However, indirect impacts could result during and following the Project through the introduction of invasive plant species or from inadvertent contact with heavy machinery. Potential impacts would be avoided or mitigated through the implementation of **Mitigation Measures BIO-2**, which requires worker environmental awareness training, **Mitigation Measure BIO-3**, which requires control of invasive plants, and **Mitigation Measure BIO-5** which requires general construction site best management practices.

Mitigation Measures

See **Mitigation Measures BIO-2, BIO-3,** and **BIO-5** listed above.

Significance Determination

Less than significant impact with mitigation incorporated.

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

The Study Area is within the Saint Johns Canyon Subwatershed (Hydrologic Unit Code 12-180702020301). One unnamed ephemeral stream (i.e., ES1) with an unnamed ephemeral tributary (i.e., ES2) is located within the Study Area. ES1 takes the form of a wash within the Study Area of the proposed Mission Canyon II Pump Station site (component 1) and is contained within a defined stream channel within the Study Areas of component 2 (existing Mission Canyon II Pump to be demolished) and component 6 (installation of 1,050 LF of 2-inch service line from the existing 6-inch pipeline along Gibbel Road to 40751 Gibbel Road). ES2 is a small ephemeral stream that originates about halfway up the Study Area of component 3 (installation of 3,200 LF of new 12-inch pipeline in Gibbel Road south of the new pump station). ES2 travels from south to north down the north aspect of Polly Butte Road. The stream contains a definable bed and bank on the southwest side of the component 3 Project Area (i.e., Gibbel Road) and surface flows across the work area to the north side and into a gully.

ES1 and ES2 do not meet the United States Army Corps of Engineers definition of a relatively permanent water and they do not have direct surface connection to a Navigable Water or a Traditional Navigable Water. Therefore, ES1 and ES2 would likely not be considered waters of the U.S, and impacts to jurisdictional waters as a result of the Project are not anticipated. The limits of the Project Area of the proposed Mission Canyon II Pump Station (component 1) and northern staging area avoid the jurisdictional limits of ES1 (as mapped by ELMT Consulting, Inc in the jurisdictional delineation (**Appendix C**). The Project Area of component 3 (installation of 3,200 LF of new 12-inch pipeline in Gibbel Road south of the new pump station is entirely within Gibbel Road and therefore avoids the jurisdictional limits of ES2. All work within the Project Areas of component 2 (existing pump station to be demolished) and component 6 (installation of 1,050 LF of 2-inch service line from the existing 6-inch pipeline along Gibbel Road to 40751 Gibbel Road) would take place above the potentially jurisdictional culvert, outside of the banks of ES1, and would not involve the removal of any associated riparian trees or vegetation. Figures depicting the jurisdictional extents in relation to the Project Area are provided in **Appendix C**. If it is determined during Project implementation that impacts would occur to the jurisdictional features (i.e., ES1, ES2, and their associated riparian habitat and culvert) mapped within the Study Area, consultation with the RWQCB and/or CDFW and the obtainment of a General Waste Discharge Requirements Permit for non-federal waters and/or a Streambed Alteration Agreement would be required.

<u>Mitigation Measures</u>

None required or recommended.

<u>Significance Determination</u>

Less than significant impact.

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?

Project activities would generally be limited to the developed/landscaped and disturbed portions of the Study Area, which offer little to no value to wildlife movement. Additionally, construction related disturbance within the Study Area that could potentially deter wildlife movement would be temporary, limited to daytime hours, and an ample amount of suitable wildlife movement habitat is located outside of the Project Area. Therefore, impacts to wildlife movement would be less than significant.

<u>Mitigation Measures</u>

None required or recommended.

<u>Significance Determination</u>

Less than significant impact.

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

According to Chapter 12.24 of the Riverside County Code, any native trees at or above 12 inches in diameter at breast height (DBH) above grade and 30 feet in height shall be protected above 5,000 feet above mean sea level (amsl). Native trees with a DBH of 12 inches or greater with a height of 30 feet or more are present within the Study Area; however, the Study Area is below 5,000 feet amsl. Therefore, there are no protected trees within the Study Area per the Riverside County Code. Furthermore, tree removal would not be conducted as a part of the Project. Therefore, there would be no impact to protected trees.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

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?*

The Study Area lies within the boundaries of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) and the ephemeral drainages within the Study Area likely meet the definition of riparian/riverine under Section 6.1.2 of the Western Riverside County MSCHP. However, EMWD is not a Permittee under the Western Riverside MSHCP. The requirements of the MSHCP therefore do not directly apply to EMWD, meaning EMWD does not have to demonstrate consistency. However, pursuant to CEQA Guidelines Appendix G Checklist, Biological criterion "f", EMWD cannot conflict with the MSHCP requirements. With implementation of the biological resource mitigation measures specified in this IS/MND, the Project would not conflict with the MSHCP requirements.

The Study Area is also within the Stephen's Kangaroo Rat Mitigation Fee area. However, EMWD is not a signatory to the Stephen's Kangaroo Rat Habitat Conservation Plan (SKR HCP). Furthermore, the Project is not expected to result in impacts to the Stephen's Kangaroo rat (*Dipodomys stephensi)*. Therefore, the Project would not conflict with the SKR HCP.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

3.5 Cultural Resources

Would the Project:	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	[ ]	[X]	[ ]	[ ]
b) Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5?	[ ]	[X]	[ ]	[ ]
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	[ ]	[X]	[ ]	[ ]

Discussion

A Cultural Resources Technical Report was prepared for the proposed Project in January 2024 by Rincon Consultants. The report includes a cultural resources records search of the California Historical Resources Information System (CHRIS) at the Eastern Information Center (EIC), a Sacred Lands File (SLF) search conducted by the Native American Heritage Commission (NAHC), a review of historical aerial imagery and topographic maps, pedestrian surveys of the project site, and geoarchaeological analysis. As part of the report, the National Register of Historic Places, the California Register of Historical Resources, the California Historical Landmarks list, the Archaeological Determination of Eligibility list, and the Built Environment Resources Directory, as well as its predecessor the California State Historic Property Data File, were also reviewed. The *Cultural Resources Technical Report* is provided in **Appendix D**.

A discussion of the proposed Project's potential impacts to tribal cultural resources, including tribal outreach and consultation, is provided in *Section 3.18 Tribal Cultural Resources*.

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

On February 17, 2023, a records search of the CHRIS was requested. A supplemental CHRIS records search was requested on August 31, 2023. The purpose of a records search is to identify previously recorded cultural resources, as well as previously conducted cultural resources studies within the project site and a 1-mile radius surrounding it. Results from the records search identified 29 previously recorded cultural resources studies completed within 1 mile of the proposed Project area, none of which are located on the site of any Project components. Six of these studies have been conducted within and adjacent to the proposed Project area. As part of the Cultural Resources Technical Report, a pedestrian survey of the proposed Mission Canyon II Pump Station (component 1) was conducted on May 9, 2023. A subsequent pedestrian survey of the remaining Project components was conducted on September 15, 2023.

The CHRIS records search and background research identified 21 cultural resources within 1 mile of the Project area. Only one of these could be considered eligible as a historical built environmental resource under CEQA. However, the field survey confirmed the resource is located outside of the Project site boundaries. No other historical built environment properties were identified during the field survey and review of historical aerial imagery and topographic maps. Therefore, the Project does not have the potential to impact historical built environment resources and there would be no impact to historical resources pursuant to CEQA.

Although no historical resources have been identified within the Project sites, the proposed Project would involve ground disturbing activities during construction, and there is potential to encounter previously unknown historical resources. Implementation of **Mitigation Measure CUL-1** would ensure proper procedures are in place to reduce potential impacts to previously unknown historical resources in the event of an accidental discovery during construction, and **Mitigation Measure CUL-2** would ensure any artifacts discovered during construction are properly evaluated and inventoried. Operation of the proposed Project would not involve ground disturbing activities and would therefore have no impact on historical resources. Impacts would be less than significant.

With implementation of **Mitigation Measures CUL-1** and **CUL-2** potential impacts from construction resulting in an adverse change to historic resources would be less than significant.

Mitigation Measures

CUL-1 Cultural Resources Monitoring and Plan Development. Prior to grading activities, a Cultural Resources Monitoring Plan (plan) shall be prepared by a qualified archaeologist in consultation with the Consulting Tribe(s). The plan shall also identify the location and timing of cultural resources monitoring. The plan shall contain an allowance for the qualified archaeologist, based on observations of subsurface soil stratigraphy or other factors during initial grading, and in consultation with the Native American monitor and the lead agency, may reduce or discontinue monitoring as warranted if the archaeologist determines that the possibility of encountering archaeological deposits is low. The plan shall outline the appropriate measures to be followed in the event of unanticipated discovery of cultural resources during project implementation (including the survey to occur following vegetation removal and monitoring during ground-disturbing activities). The plan shall identify avoidance as the preferred manner of mitigation impacts to cultural resources. The plan shall establish the criteria utilized to evaluate the historic significance (per CEQA) of the discoveries, methods of avoidance consistent with CEQA Guidelines Section 15126.4(b)(3), as well as identify the appropriate data recovery methods and procedures to mitigate the effect of the project if avoidance of significant historical or unique archaeological resources is determined to be infeasible. The plan shall also include reporting of monitoring results within a timely manner, disposition of artifacts, curation of data, and dissemination of reports to local and state repositories, libraries and interested professionals. A qualified archaeologist and Consulting Tribe(s) tribal monitor shall attend a pre-grade meeting with Eastern Municipal Water District staff, the contractor, and appropriate subcontractors to discuss the monitoring program, including protocols to be followed in the event that cultural material is encountered.

CUL-2 Evaluation of Discovered Artifacts. Artifacts discovered at the development site shall be inventoried and analyzed by the project archaeologist and tribal monitor(s). A monitoring report will be prepared, detailing the methods and results of the monitoring program, as well as the disposition of cultural material encountered. If no cultural material is encountered, a brief letter report will be sufficient to document monitoring activities.

Significance Determination

Less than significant impact with mitigation incorporated.

b) Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5?

In addition to the California Historical Resources Information System records searches, a search of the NAHC SLF was requested on February 17, 2023. The results of the CHRIS records search and SLF search conducted by the NAHC suggest the vicinity of the Project site is sensitive for prehistoric archaeological resources. The SLF returned positive results and 20 prehistoric archaeological resources were identified within 1 mile of the Project area.

Although there are no known archaeological resources within the Project sites, the recorded boundaries of two prehistoric archaeological resources are within close proximity to (P-33-000278 and P-33-011495) the Project site. One site (P-33-011495)is especially sensitive and has been previously recommended eligible for listing in the NRHP and CRHR. Thus, the Project area is considered sensitive based on previous studies and the locations of known archaeological deposits.

Implementation of **Mitigation Measure CUL-3** which requires the establishment of an Environmentally Sensitive Area (ESA) within 25 feet of the known boundary of site P-33-011495 during construction activities, would help ensure avoidance of this known cultural resource.

The proposed Project would involve ground disturbing activities during construction and there is potential to encounter previously unknown archaeological resources. Impacts would be reduced to less than significant with implementation of **Mitigation Measure CUL-1** which requires a cultural resources monitoring plan be developed to address the inadvertent discovery of archaeological resources, **Mitigation Measure CUL-2** which requires an evaluation of any discovered artifacts, and **Mitigation Measure CUL-3** which requires the establishment of an ESA within 25 feet of the known boundary of site P-33-011495 during construction activities to help ensure avoidance of this known cultural resource.

With implementation of mitigation measures, potential impacts from construction resulting in an adverse change to cultural resources would be less than significant.

<u>*Mitigation Measures*</u>

CUL-1 Cultural Resources Monitoring and Plan Development – Refer to *Section 3.5*, *a)* above.

CUL-2 Evaluation of Discovered Artifacts – Refer to *Section 3.5 a)* above.

CUL-3 Establish an ESA for P-33-011495. An Environmentally Sensitive Area (ESA) shall be established for the known boundary of P-33- 011495 and an additional 25-foot buffer. This ESA shall be flagged with stakes and flagging tape prior to the start of permitted construction activities.

Significance Determination

Less than significant impact with mitigation incorporated.

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

As stated under "b" above, although there are no known archaeological resources within the Project sites, the Project area is considered sensitive based on previous studies and the locations of known archaeological deposits. The proposed Project would involve ground disturbing activities during construction and there is potential to encounter previously unknown human remains. Implementation of **Mitigation Measure CUL-4** would ensure proper procedures are in place to reduce potential impacts to previously unknown human remains in the event of an accidental discovery during construction. Impacts would be less than significant with mitigation incorporated.

Mitigation Measures

CUL-4 Procedure for the Discovery of Human Remains. If Native American human remains are encountered, Public Resources Code Section 5097.98 and California Health and Safety Code Section 7050.5 will be followed. If human remains are encountered no further disturbance shall occur until the Riverside County Coroner has made the necessary findings as to the origin. Further, pursuant to California Public Resources Code Section 5097.98(b), the remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the Riverside County Coroner determines the remains to be Native American, the coroner shall contact the NAHC within 24 hours. Subsequently, the NAHC shall identify the person or persons it believes to be the "most likely descendant." The most likely descendant shall then make recommendations and engage in consultations concerning the treatment of the remains as provided in Public Resources Code Section 5097.98.

Significance Determination

Less than significant impact with mitigation incorporated.

3.6 Energy

	Potentially Significant Impact	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	[ ]	[ ]	[X]	[ ]
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	[ ]	[ ]	[X]	[ ]

<u>*Discussion*</u>

Electrical service for the proposed Project area is provided by Southern California Edison (SCE). SCE is one of the largest providers of electricity in southern California and serves 15 million people, 180 incorporated cities, and 15 counties (SCE n.d.). According to SCE's power content label for 2021, its electricity comes from approximately 31.4 percent renewables, 2.3 percent large hydroelectric, 22.3 percent natural gas, 9.2 percent nuclear, and 34.8 percent from other and unspecified power sources through transactions (SCE 2021). Natural gas service for the entire proposed Project area is provided by the Southern California Gas Company.

The Riverside County Multipurpose Open Space Element contains policies that are intended to conserve, or manage the use of, resources and those that seek to preserve resources for the purpose of sustaining their stocks in perpetuity (County of Riverside 2015).

Riverside County's 2015 Climate Action Plan (CAP) established the County's sustainability and conservation measures based on an unincorporated Riverside County baseline inventory of greenhouse gas (GHG) emissions, and established emissions reduction targets in accordance with the State reduction goals. The emissions categories included in the baseline GHG inventory were transportation, energy, (electricity and natural gas), area sources, purchased water, solid waste, and agriculture (County of Riverside 2019c). The 2019 CAP Update established a framework under which future projects would be designed for the purposes of reducing GHG emissions. The 2019 CAP Update is a companion document to the County General Plan to provide a more comprehensive and detailed framework for land-based policy decisions to reduce GHG emissions from existing and future development. Any future projects proposed pursuant to the 2019 CAP Update would be developed in accordance with General Plan Policies for energy conservation while maximizing efficient use of resources, maintaining a high quality of life, enhancing job opportunities, promoting sustainability, and facilitating access to transportation facilities (County of Riverside 2019c).

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

Construction of the proposed Project would involve standard construction practices such as excavation, grading, and repaving and would require fossil fuel consumption typically associated with operation of diesel-powered construction equipment or vehicles used to transport workers and haul and deliver materials. The anticipated fleets for demolition of the existing pump station, construction of the replacement pump station, and construction of the new pipelines are specified in *Section 2.4.5 Construction Equipment*. Estimates of the number of worker, hauling, and vendor trips, as well as the construction vehicle fleet were based on information in *Section 2.4.5* and CalEEMod model assumptions, which are based on surveys of similar construction activities. Further details can be found in **Appendix A**.

The proposed Project would implement typical construction practices such as trenching and repaving. The Project would not require unusual or excessive construction equipment or practices that would result in wasteful, inefficient, or unnecessary consumption of energy compared to projects of similar type and size (see *Section 2.4.5 Construction Equipment*). In addition, the construction fleet contracted for the proposed Project would be required to comply with the California Air Resources Board (CARB) In-Use Off-Road Diesel-Fueled Fleets Regulations (CARB 2011), which would limit vehicle idling time to five minutes, restrict adding vehicles to construction fleets with older-tier engines, and establish a schedule for retiring older, less fuel-efficient engines from the construction fleet.

Operation of the proposed Project would involve consumption of electricity from SCE to power the new Mission Canyon II Pump Station. Since the proposed Mission Canyon II Pump Station would replace the existing pump station, it is anticipated that there would be no overall change to EMWD's existing annual energy consumption of 11,400 kWh. Use of the proposed 300-kW back-up generator would be limited to emergencies and during pump maintenance once per month. Additionally, no change to EMWD's operation and maintenance (O&M) schedule would be expected and routine inspection would be incorporated into EMWD's existing O&M activities. No additional vehicle trips or employees would be needed for O&M of the replacement Mission Canyon II Pump Station. The proposed Project pipelines would not be associated with long-term energy usage because O&M activities would be incorporated into EMWD's existing O&M activities.

The Project would not require unusual or excessive construction equipment or practices that would result in wasteful, inefficient, or unnecessary consumption of energy compared to projects of similar type and size. As such, construction and operation of the proposed Project would not result in wasteful, inefficient, or unnecessary consumption of energy during construction and impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

The Riverside County CAP is a comprehensive roadmap that outlines the specific activities that the County will undertake to reduce GHG emissions. The 2019 CAP Update focuses on those activities that can achieve the greatest emission reductions in the most cost-effective manner in achieving the reduction targets (County of Riverside 2019a).

Since the proposed Mission Canyon II Pump Station would replace the existing pump station, it is anticipated that there would be no overall change to EMWD's existing O&M schedule. No additional vehicle trips or employees would be needed for O&M of the replacement Mission Canyon II Pump Station. The proposed Project would not involve land use changes that would indirectly result in an increase in vehicle trips or vehicle miles travelled. As explained under question "a" above, operation of the Project would not involve wasteful or inefficient energy consumption. The Project would not conflict or obstruct the Riverside County CAP and local plans for renewable energy or energy efficiency. Impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

3.7 Geology and Soils

	Potentially Significant Impact	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	[ ]	[ ]	[X]	[ ]
ii) Strong seismic ground shaking?	[ ]	[ ]	[X]	[ ]

iii) Seismic-related ground failure, including liquefaction?	[ ]	[ ]	[X]	[ ]
iv) Landslides?	[ ]	[ ]	[X]	[ ]
b) Result in substantial soil erosion or the loss of top soil?	[ ]	[ ]	[X]	[ ]
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?	[ ]	[ ]	[X]	[ ]
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	[ ]	[ ]	[X]	[ ]
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?	[ ]	[ ]	[ ]	[X]
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	[ ]	[X]	[ ]	[ ]

Discussion

The Project area is situated along low-lying hilly terrain within the northwesternmost portion of the Santa Rosa Hills and is underlain by Quaternary-aged (2.6 million years ago) surficial deposits consisting of granitic and other intrusive crystalline rocks of all ages (CDOC 2022b). The Project site lies within a seismically active region and is therefore subject to earthquake risks and hazards including fault displacement and rupture, ground shaking, liquefaction, lateral spreading, landslides, and structural hazards. However, the site is not located within a State of California "Alquist-Priolo Earthquake Fault Zone" for fault rupture hazard (**Figure 3-5**).

A project-specific Geotechnical Investigation was completed by Inland Foundation Engineering, Inc (IFE) in September 2023. The complete report is provided in **Appendix E.** Two geotechnical issues were identified in the investigation: (1) the presence of loose soil in the proposed relocated pump station area and the potential for seismic liquefaction and settlement, and (2) the potential for difficult excavation during pipeline construction due to the unknown presence of boulders or bedrock. However, the report concluded construction of the new pipelines and relocated pump station site is feasible from a geotechnical engineering standpoint on the basis of the field and laboratory exploration and testing (IFE 2023)

a.i) **Directly or indirectly caused potential substantial adverse effects, including the risk of loss, injury, or death involving: Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 41.**

The potential for ground rupture is most likely to occur along the traces of active faults. There are at least 38 late Quaternary active/potentially active faults within 60 miles of the Project site. Of these, there are no faults known to traverse the site, nor is there any photogeologic or surficial geomorphic evidence suggestive of faulting (IFE 2023). The nearest potentially active fault mapped in accordance with the Alquist-Priolo Earthquake Fault Zoning Act is the Casa Loma segment of the San Jacinto Valley section of the San Jacinto Fault Zone, located approximately 2.4 miles (4.0 kilometers) northeast of the subject site. The major faults influencing the site, distances and estimated maximum earthquake magnitudes are presented in Table 3 7.

Table 3-7: Major Faults in the Project Area

Fault Zone	Approximate Distance (km)	Earthquake Magnitude (Mw)
San Jacinto – San Jacinto Valley (Casa Loma and Clark)	4.0	7.0
San Jacinto – Anza	4.5	7.2
Elsinore – Temecula	29.2	6.8
San Andreas – Southern	30.1	7.4

Note: kilometer (km); maximum moment magnitude (Mw)
Source: IFE 2023

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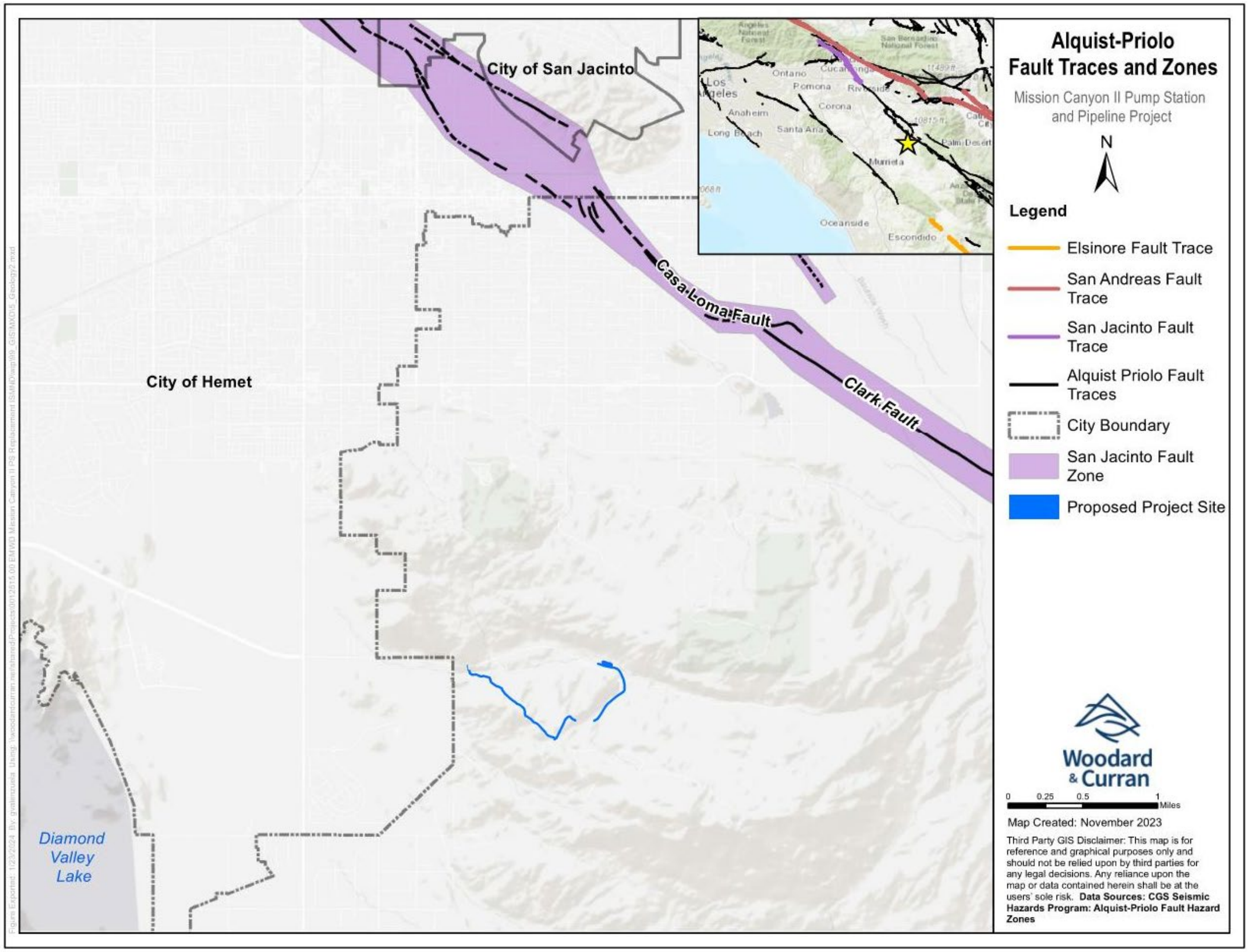
Figure 3-9: Alquist-Priolo Fault Traces and Zones



Although the proposed Project area is within a seismically active region of southern California, the Project area is not within a fault zone as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map (**Figure 3-5**). Based on review of the published geologic maps and the project specific geotechnical report, the potential for ground rupture at the site is considered to be low. Thus, impacts related to rupture of a known earthquake fault would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

a.ii) Directly or indirectly caused potential substantial adverse effects, including the risk of loss, injury, or death involving: Strong seismic ground shaking?

The proposed Project area is located within a seismically active region of southern California near local and regional faults capable of generating earthquakes with strong ground shaking. During the life of the Project, seismic activity associated with active faults can be expected to generate moderate to strong ground shaking at the Project site. The intensity of ground shaking would depend upon the magnitude of the earthquake, distance to the epicenter, and the geology of the area between the epicenter and the project area. The major faults influencing the site, distances and maximum earthquake magnitudes are presented in **Table 3-7**. Considering the proximity of the Project area to active faults capable of producing a maximum magnitude of 6.0 or more, the Project components would likely be subject to seismic ground shaking in a measurable seismic event.

Although impacts related to strong seismic ground shaking would potentially be significant in the Project area, the proposed Project would not include any land use components that would induce growth or otherwise bring additional people to the area or structures people would occupy that would be at risk of loss, injury of death from strong seismic ground shaking.

In accordance with EMWD's existing Standard Construction Practices (see *Section 2.6*), the Project would be designed and constructed pursuant to recommendations and requirements of the IFE's 2023 Geotechnical Investigation Report (**Appendix E**). In addition, the Project would be designed and constructed per EMWD's Engineering Standards and Specifications, as well as applicable American Water Works Association standards and would incorporate measures to accommodate seismic loading pursuant to guidelines such as the "Greenbook" Standard Specifications for Public Works Construction (Greenbook Committee of Public Works Standards, Inc. 2021) and the International Building Code (International Code Council 2021). These guidelines are produced through joint efforts by industry groups to provide standard specifications for engineering and construction activities, including measures to accommodate seismic loading parameters. These standards and guidelines are widely accepted by regulatory authorities and are regularly included in related standards such as municipal building and grading codes. In addition, the Project design would follow guidelines within the California Building Code (California Code of Regulations, Title 24, Part 2), which is based on the IBC with amendments to reflect conditions specific to California (Division of the State Architect 2021).

Because building and construction codes related to seismic shaking would be followed, there would be less potential for structural damage or loss due to seismic ground shaking. Even if structural damage does occur during a seismic event, it would be isolated to the various Project components; the Project would not exacerbate a risk of seismic-related damage to other existing resources and land uses in the vicinity. Impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

a.iii) Directly or indirectly caused potential substantial adverse effects, including the risk of loss, injury, or death involving: Seismic-related ground failure, including liquefaction?

Liquefaction is the process by which clay-free soil, such as sands and silts, temporarily lose cohesion and strength and turn into a fluid state during a severe ground shaking event. This primarily occurs in areas saturated with high groundwater levels and recent deposits of sand and silts. Based on review of the Riverside County Mapping Portal Liquefaction mapping tool, the Project area is not located within a designated liquefaction hazard zone (County of Riverside 2023a). The potential for soil liquefaction and seismically induced settlement were evaluated in a project-specific geotechnical investigation prepared by IFE in September 2023. The investigation identified the presence of loose soil in the proposed relocated pump station area and the associated potential for seismically induced liquefaction and settlement. The results of the analysis indicate a total estimated settlement of more than 5 inches at ground surface due to seismic shaking.

However, the Project would be designed and constructed in accordance with the recommendations of the IFE's Geotechnical Investigation as well as with EMWD's Engineering Standards and Specifications, and other standards and guidelines described under "*a.ii*" above, which would reduce any potential impacts associated with liquefaction. The proposed Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure including liquefaction. Impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

Landslides can occur when strong ground movement such as an earthquake shakes loose soil and causes land and debris to lose stability and slide. Areas considered most susceptible to earthquake-induced landslide are typically associated with slopes and unstable soils. Steep topography fractured and unconsolidated bedrock conditions, and expansive soils make hillside areas unstable. The Mission Canyon II Pump Station replacement site is not located on a hillside and the proposed pipelines would be constructed within existing paved roads. The Geotechnical Investigation (IFE 2023) (see **Appendix E**) did not identify landslides or slope failure as geotechnical concerns for the proposed Project. However, all Project facilities would be designed in accordance with EMWD's Engineering Standards and Specifications and the other standards and guidelines described under "*a.ii*" above, as well as recommendations in the IFE Geotechnical Investigation which would limit the potential for the Project to directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death resulting from a landslides or slope failure. Demolition of the existing Mission Canyon II Pump Station and abandonment of the existing pipeline segment would have no impact. Therefore, the Project would have a less than significant impact.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

The proposed Project could result in minor erosion of soil or loss of topsoil during construction, in particular due to the presence of soil stockpiles which are susceptible to erosion during wind, rain, or other storm events. Construction of the new pipelines and demolition of the existing pump station would require trenching; construction of the replacement Mission Canyon II Pump Station would require import of fill to construct an elevated building pad. However, once construction is completed, disturbed surfaces would be restored to pre-construction conditions, or be newly paved and/or stabilized with gravel to reduce further soil erosion. Abandonment of the existing 6-inch CML&C discharge line would have little to no potential to create soil erosion.

Project construction would disturb more than one acre of land in total and would require a SWRCB National Pollutant Discharge Elimination System (NPDES) Construction General Permit and preparation of a Stormwater Pollution Prevention Plan (SWPPP). Best management practices would be identified in the SWPPP to control and reduce pollutant discharges associated with construction activities and erosion of soil. In accordance with EMWD's Standard Construction Practices (see *Section 2.6*), potential BMPs include site management "housekeeping," erosion control, sediment control, tracking control and wind erosion control. With implementation of the standard construction BMPs, the potential for soil erosion or the loss of topsoil during construction of the proposed Project would be considered less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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?

As discussed in responses *a.iv* and *a.iii* above, the Project's potential to result in unstable soils from landslides, liquefaction (or lateral spreading which is induced by liquefaction) was determined to be less than significant with adherence to IFE's Geotechnical

Investigation design recommendations, EMWD's Engineering Standards and Specifications, and other standards and guidelines which would ensure structural resiliency to earthquake events and any other causes of lateral spreading or liquefaction. In addition, fill materials used to elevate the construction pad for the pump station facilities and backfill the pipeline trenches would be compacted and stabilized in accordance with IFE's Geotechnical Investigation design recommendations, EMWD's Engineering Standards and Specifications, and other standards and guidelines that would minimize risk of subsidence or collapse. Therefore, the Project is not expected to result in significant risk of landslide, lateral spreading, liquefaction, subsidence, or collapse. Impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

Expansive soils have the ability to significantly change their volume, shrink and swell, due to their soil moisture content. Expansive soils can crack rigid structures and potentially create pipeline rupture. Typically, expansive soils are very fine grained with a high to very high percentage (60 percent or more) of clay. Based on the United States Department of Agriculture Web Soil Survey (USDA 2023), the Project components would be located in a soil area that is well drained to excessively drained and primarily consists of a combination of rocky sandy loam, coarse sandy loam, and loamy sand (**Figure 3-6**). Based on the clay particle content of the soil, the potential for the Project site to be located within expansive soils is low.

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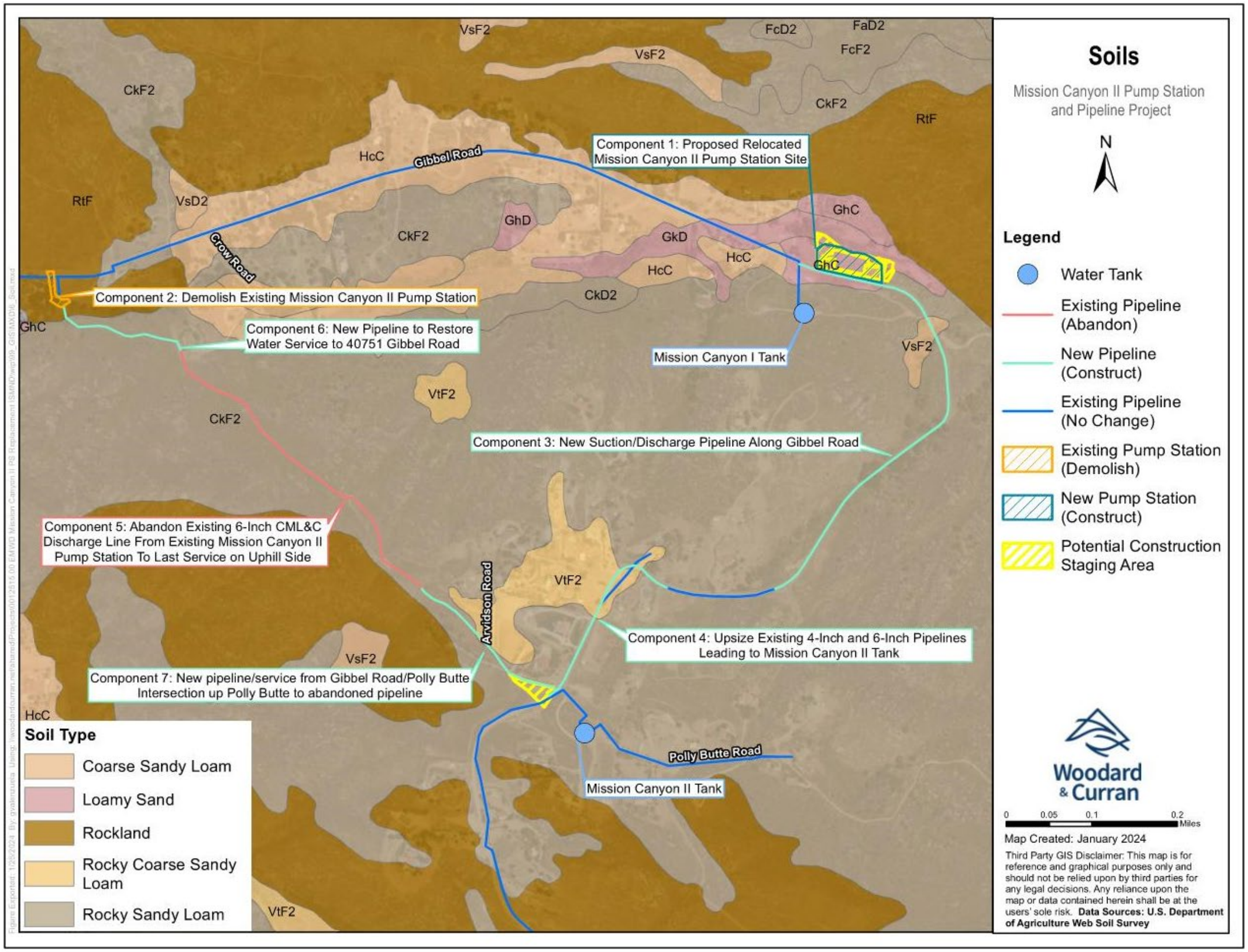
Figure 3-10: Soils



While the project-specific Geotechnical Investigation (IFE 2023) identified potentially expansive soils present at the replacement Mission Canyon II Pump Station site, adherence to the Geotechnical Investigation design recommendations, EMWD's Engineering Standards and Specifications, and other standards and guidelines would ensure structural resiliency. In addition, fill materials used to elevate the construction pad for the pump station facilities and to backfill the pipeline trenches would be compacted and stabilized and thus would reduce risk from expansive soils. As a result, the Project's construction is not expected to result in substantial direct or indirect risks to life or property. Impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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?

The Project does not propose the construction or use of septic tanks or alternative wastewater disposal systems. Therefore, there would be no impact.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

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

A *Paleontological Resources Assessment* was prepared for the proposed Project by Rincon Consultants (Rincon Consultants, Inc. 2024). (see **Appendix F**). Paleontological sensitivity of the geological units underneath the proposed Project area was assessed through a literature review, a paleontological locality search, and a review of existing geologic maps. A records search was submitted to the Western Science Center for a list of known fossil localities for the proposed Project area and immediate vicinity. The potential for impacts to significant paleontological resources was assessed based on the potential for ground disturbance to directly impact paleontological sensitive geologic units as defined by the Society of Vertebrate Paleontology.

Results of the Paleontological Resources Assessment concluded the proposed Project area is underlain by three geologic units: Quaternary old axial channel deposits, Quaternary old alluvial fan deposits, and Hemet Pluton. Sediments similar to Quaternary old axial channel deposits and Quaternary old alluvial fan deposits have produced scientifically significant paleontological resources throughout Riverside County; therefore, the County of Riverside has assigned these geologic units a "High A" paleontological sensitivity. The Hemet Pluton is formed of intrusive igneous rock, which cannot preserve paleontological resources and, therefore, has low paleontological sensitivity. A records search of the Western Science Center recovered no known fossil localities within one mile of the Project area.

Although there are no known fossils uncovered within the Project area, ground-disturbing activities that affect previously undisturbed portions of geologic units with a "High A" paleontological sensitivity could result in significant impacts to paleontological resources. Construction of the proposed Project would include ground-disturbing activities including trenching for new pipeline segments and excavations to remove approximately 10 linear feet of pipeline associated with the existing Mission Canyon II Pump Station. Trenching for Components 3, 4, and 7, do not have the potential to significantly impact paleontological resources because they would only impact low-sensitivity geologic units. Components 1, 2, and 5, do not have the potential to significantly impact paleontological resources, because these activities would not impact previously undisturbed sediments. Excavation of small pits along Component 6, conversely (installation of 1,050 LF of 2-inch service line from the existing 6-inch pipeline along Gibbel Road to 40751 Gibbel Road), would impact sediments with a "High A" paleontological sensitivity and may significantly impact paleontological resources. **Mitigation Measure GEO-1** would be implemented prior to the start of construction of Component 6 and would require a paleontological Worker Environmental Awareness Program (WEAP) training be conducted for construction personnel. **Mitigation Measure GEO-2** would be implemented during construction and would require work stop if a fossil is encountered during construction until a qualified paleontologist can properly document the find. In the unlikely event an unanticipated fossil is discovered, **Mitigation Measure GEO-2** would ensure it would be preserved, and potential impacts on paleontological resources would be less than significant. With the implementation of **Mitigation Measures GEO-1** and **GEO-2**, impacts associated with paleontological resources would be reduced to less than significant.

Mitigation Measures

GEO-1 Paleontological Worker Environmental Awareness Program. Prior to the start of construction at Component 6 (installation of 1,050 LF of 2-inch service line from the existing 6-inch pipeline along Gibbel Road to 40751 Gibbel Road), a Qualified Professional Paleontologist, as defined by the Society of Vertebrate Paleontology (SVP 2010), or their designee shall conduct a paleontological Worker Environmental Awareness Program (WEAP) training for construction personnel regarding the appearance of fossils and the procedures for notifying paleontological staff should fossils be discovered by construction personnel.

GEO-2 Unanticipated Discovery of Paleontological Resources. EMWD shall include the following standard inadvertent discovery clause in every construction contract to inform contractors of this requirement: If a potential fossil is discovered during project construction, construction activity within 50 feet of the find shall cease until the discovery is examined by a Qualified Professional Paleontologist. If the find is determined to be significant, the Qualified Professional Paleontologist shall direct all mitigation measures related to paleontological resources consistent with the SVP (2010) standards.

Significance Determination

Less than significant impact with mitigation incorporated.

3.8 Greenhouse Gas Emissions

	Potentially Significant Impact	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	[ ]	[ ]	[X]	[ ]

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

Greenhouse gases (GHGs) are pollutants that are known to increase the greenhouse effect in the Earth's atmosphere thereby adding to global climate change impacts. Several pollutants have been identified as GHGs, and the State of California definition in the Health and Safety Code, Section 38505(g) includes carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (CARB 2024). Water vapor is also identified as a GHG; however, it is short lived, and concentrations are largely determined by natural processes such as evaporation. Other GHGs such as fluorinated gases are created and emitted through anthropogenic sources. The most common anthropogenic GHGs are CO_2, CH_4, and N_2O.

A measurement called global warming potential (GWP) is used to measure how much energy the emissions of one ton of a gas will absorb over a given period of time, relative to the emissions of one ton of CO_2. CO_2e is the amount of GHG emitted multiplied by its GWP. CO_2 has a 100-year GWP of one; CH_4 has a GWP of 25; and N_2O has a GWP of 298 (CARB 2024).

In 2005, the Governor issued Executive Order (EO) S-3-05, which set GHG emission reduction targets:

- 2010 should have 2000 levels;
- 2020 should have 1990 levels; and
- GHG emissions should be 80 percent below 1990 levels by 2050.

Senate Bill (SB) 32, passed in 2016, required that the CARB include in its next update to the Assembly Bill (AB) 32 Scoping Plan, "ensure that statewide GHG emissions are reduced to at least 40 percent below the statewide GHG emissions limit no later than December 31, 2030." (EO) B-55 set a GHG emission reduction target for California to be carbon neutral by 2045.

The CARB has adopted three Climate Change Scoping Plans with the purpose of establishing specific GHG reduction targets. The 2008 Scoping Plan's target was to meet 1990 levels by 2020; the 2017 Scoping Plan Update's target was to meet a more aggressive target of 40 percent below 1990 levels by 2030; and the 2022 Scoping Plan Update's target is reducing anthropogenic emissions to 85 percent below 1990 levels by 2045. AB 1279 requires CARB to ensure that Scoping Plan updates identify and recommend measures to achieve carbon neutrality, and to identify and implement policies and strategies that enable CO2 removal solutions and carbon capture, utilization, and storage technologies (CARB 2022).

The proposed Project overlies unincorporated County of Riverside and is located within the jurisdiction of the SCAQMD. The SCAQMD is in the process of developing an Air Quality Analysis Guidance Handbook to replace the CEQA Air Quality Handbook approved by the SCAQMD Governing Board in 1993. In order to assist CEQA related air quality analysis while the new Handbook is being prepared, SCAQMD updated its Air Quality Significance Thresholds in March 2023. The SCAQMD has set a GHG threshold of 10,000 $MTCO_2e$/year for industrial facilities (SCAQMD 2023).

The County of Riverside CAP was adopted in 2015 to establish goals and policies that incorporate sustainability and GHG reduction targets into its management process. The County of Riverside adopted a CAP Update in 2019 which re-evaluated the County's GHG reduction targets and existing reduction strategies. The new goals and supporting measures are proposed to reflect and ensure compliance with changes in the local and State policies and regulations which set a 2030 goal of reducing emissions to 40 percent below 1990 levels by 2030, and to make it possible to reach the ultimate goal of reducing emissions 80 percent below 1990 levels by 2050. The County's CAP has set a threshold of 3,000 metric tons CO2e per year to be used to identify projects that, when combined with the modest efficiency measures (e.g., energy efficiency matching or exceeding the Title 24 requirements in effect as of January 2017; water conservation measures that match the California Green Building Standards Code in effect as of January 2017) are considered less than significant (County of Riverside 2019a).

<u>Discussion</u>

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

Proposed Project emissions of GHGs were estimated using the CalEEMod version 2022.1.1.21. The CalEEMod emissions estimations were based on Project-specific information, found in *Section 2 Project Description*. In instances where Project-specific information was not available (e.g., construction equipment horsepower, length of worker trips, soil moisture content), the analysis relied on CalEEMod default values.

The proposed Project would create GHG emissions during construction, which is anticipated to last approximately 18 months. Construction impacts would result from short-term construction activities which would require the use of construction equipment with internal combustion engines, and offsite vehicles to transport workers, deliver materials to the site, and haul import and export material to and from the site. **Table 3-8** summarizes the estimated CalEEMod results of the inventory for GHG emissions for construction of the proposed Project along with the County of Riverside 2019 CAP threshold of 3,000 metric tons CO2e per year. Consistent with the methodologies in the SCAQMD 2008 Board Letter, total GHG emissions from construction have been amortized over a 30-year lifetime of the project[1]. The complete CalEEMod Air Quality Data Sheets are provided in **Appendix A**.

Table 3-8: Estimated GHG Emissions per Year ($MTCO_2e$/year)

Source	$MTCO_2e$
Operation	negligible
Construction (amortized over 30 years)	395.4
Total	**251**
Regional Threshold	*3,000*
Threshold exceeded?	**No**

County of Riverside 2019

Based on the results of CalEEMod, construction of the proposed Project would emit a total of 11,861 $MTCO_2e$. Amortized over a 30-year period, construction of the proposed Project would generate approximately 395.4 $MTCO_2e$ per year. In addition to the low per-year generation of $MTCO_2e$, the Project would adhere to existing energy efficiency requirements during construction, including CARB's In-Use Off-Road Diesel-Fueled Fleets Regulations that limit vehicle idling time to five minutes restrict adding vehicles to construction fleets that have lower than Tier 3 engines, and establish a schedule for retiring older and less fuel-efficient engines (CARB 2011). Construction-related GHG impacts would be less than significant.

[1] The SCAQMD Board Letter - Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans (SCAQMD 2008) recommends construction emissions be amortized over a 30-year project lifetime.

As shown in **Table 3-8**, the proposed Project would not generate a net increase in operation emissions because the pipelines would not require energy use to operate, and the energy consumption of the replacement pump station would be the same as the existing Mission Canyon II Pump Station. Furthermore, inspection of the pipelines and replacement pump station would be incorporated into EMWD's existing O&M trips (see *Section 2 Project Description* for additional information).

The State of California has set targets for renewable energy from the energy sector through the Renewable Portfolio Standard. The Renewable Portfolio Standard directs energy utilities to source half of their electricity sales from renewable sources by 2030 (CEC 2017). Construction of the proposed Project would not require the use of electricity, and operation would not result in a net increase in electricity consumption compared to operation of the existing pump station. Therefore, the proposed Project would not conflict with or obstruct this target, and impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

California's 2022 Climate Change Scoping Plan for Achieving Carbon Neutrality lays out a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045. The proposed Project would not involve a considerable increase in new vehicle trips or land use changes that would result in an increase in vehicle trips, such as urban sprawl. The Project is designed to meet existing and anticipated demand that would occur with or without the Project and would not conflict with any of the CARB's 2022 Climate Change Scoping Plan GHG emission reduction strategies or climate change policies or measures. Furthermore, O&M activities for the Project would be conducted using EMWD's existing vehicle fleet, which is continually being improved with regard to efficiency and fuel type, consistent with the County of Riverside 2019 CAP Update.

The proposed Project would not interfere with existing city, county, or regional programs intended to reduce energy and improve water use efficiency. It would not result in GHG emissions higher than the SCAQMD significance screening threshold or County of

Riverside 2019 Climate Action Plan $MTCO_2e$/year threshold. Therefore, the proposed Project would not conflict with or obstruct a state or local plan for reducing emissions of GHGs. Impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

3.9 Hazards and Hazardous Materials

	Potentially Significant Impact	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	[ ]	[ ]	[X]	[ ]
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?	[ ]	[ ]	[X]	[ ]
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	[ ]	[ ]	[ ]	[X]
d) Be located on a site which is included on a list of hazardous	[ ]	[ ]	[ ]	[X]

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 or excessive noise for people residing or working in the Project area?	[ ]	[ ]	[ ]	[X]
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	[ ]	[ ]	[X]	[ ]
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	[ ]	[ ]	[X]	[ ]

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

Typical hazardous materials that may be used during construction and routine O&M activities include gasoline, diesel fuel, oil, solvents, and lubricants. The use of these materials for their intended purpose would not pose a significant risk to the public or environment. Hazardous and non-hazardous waste accumulated during construction activities would be handled, documented, and disposed of in accordance with federal, state, and local laws and regulations. No hazardous materials or hazardous wastes would be stored at the new Mission Canyon II Pump Station site during operation.

To minimize the risks of exposure to hazardous materials from routine use or accidents, federal, state, and local regulations have been put into place to regulate hazardous material use, storage, transportation, and handling. As specified in *Section 2.6 EMWD Standard Construction Practices*, EMWD and its contractors would be required to comply with all applicable federal, state, and local regulations pertaining to hazardous materials

(Federal Code Title 40 and 49; Occupational Safety and Health Administration (OSHA) 29 CFR 1910; California code section 5001, 5401, 5701, and 25507; California Health and Safety Code Division 20, Chapter 6.5, Article 6.5, Article 6.6, and Article 13; and Riverside County ordinance 651.5). Conformance with the above regulations would require implementation of a SWPPP to address the potential storm water discharge of contaminants (including construction-related hazardous materials) through appropriate BMPs. While specific BMPs would be determined during SWPPP development based on project and site-specific characteristics they would include standard industry measures and guidelines contained in the NPDES Construction General Permit and standard industry BMP manuals.

A *Limited Asbestos Materials and Cam-17 Metals Assessment* was conducted by Health Science Associates (HSA) in 2023 for the existing Mission Canyon II Pump Station that is proposed for demolition. The assessment found that none of the materials sampled were asbestos containing material (ACM) or asbestos containing construction material (ACCM). In general, the paint samples were determined not to contain any contaminants above the total threshold limit concentration. However, samples contained metals at levels that could exceed other regulatory levels. The yellow paint on the metal pipes contained levels of Zinc and the gray/blue paint on the concrete contained levels of Barium, Chromium, and Zinc that could fail the Soluble Threshold Limit Concentration. Therefore, in accordance with recommendations from HSA (2023), follow-up sampling and analysis will be performed by the contractor as part of the waste characterization process to determine waste characterization at the conclusion of demolition. Additionally, during demolition, paint generated waste should be segregated into different waste streams (i.e., paint chips, cleaning items, poly sheeting, etc.) and a waste profile should be conducted separately on each waste stream to comply with all local, State, and Federal laws.

Additionally, EMWD and its contractors would be required to adhere to EMWD's General Safety Requirements for Hazardous Materials and Hazardous Waste (Specification 1.15 of Section 01000-7) as noted in *Section 2.6 EMWD Standard Construction.*. These requirements address proper communication of hazardous substances on a project site, proper storage, and disposal of hazardous substances on the site, and clean-up of any spills in accordance with manufacturer and/or EPA requirements.

Additionally, EMWD Standard Construction Practices (*Section 2.6*) include conformance with federal hazardous materials transportation law (49 U.S.C. 5101 et seq.), and California Health and Safety Code Division 20, Chapter 6.5, Article 6.5 which would require precautionary measures be taken during the routine transport of hazardous materials, such as testing and preparation of a transportation safety plan. According to California Health and Safety Code Division 20, Chapter 6.5, Article 13, used oil that may be produced from construction or operation of the Project would be recycled. With compliance with existing regulations, impacts would be less than significant.

<u>*Mitigation Measures*</u>

None required or recommended.

<u>*Significance Determination*</u>

Less than significant impact.

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?

The proposed Project has the potential to expose the public and the environment to hazards through the accidental release of hazardous materials including gasoline, diesel fuel, oil, solvents, and lubricants during construction and O&M activities. As discussed in a) above, hazardous materials would be used, transported, handled, and stored in accordance with all applicable federal, state, local laws and regulations as well as EMWD general safety requirements and construction specifications noted in *Section 2.6 EMWD Standard Construction Practices*. Implementation of these regulations would minimize the risk of hazardous material exposure through material use and accidents. Thus, impacts from hazardous materials to the public or the environment from potential accidents during construction or O&M activities would be less than significant.

<u>*Mitigation Measures*</u>

None required or recommended.

<u>*Significance Determination*</u>

Less than significant impact.

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

There are no existing or proposed schools within one-quarter mile of the proposed Project area. Therefore, the Project would not be expected to impact schools through an accidental release of hazardous materials during construction.

<u>*Mitigation Measures*</u>

None required and none recommended.

Significance Determination

No impact.

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?

The California Department of Toxic Substances Control (DTSC) EnviroStor database (DTSC 2023) is a data management system for tracking DTSC cleanup, permitting, enforcement and investigation efforts at hazardous waste facilities and sites with known contamination or sites where there may be reasons to investigate further. A regulatory records search of the Envirostor database was performed for the proposed Project area on November 10, 2023. Results of the search concluded there are no active hazardous materials cleanup sites within one mile of the Project area. Additionally, none of the Project components are located on a site that is included on a list of recent or currently active clean-up or hazardous materials sites per Government Code Section 65962.5. Therefore, construction and O&M associated with the proposed Project would not create a significant hazard to the public or the environment through the release of existing materials related to a listed hazardous materials site. There would be no impact.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

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

There are no private, public, or military airports within 2 miles of the proposed Project area and the Project area is not within an airport land use plan. The nearest airport, the Hemet-Ryan Airport, is located approximately 5 miles northwest of the Project area. While the relocated Mission Canyon II Pump Station would include a 40-foot-tall communication tower, operation of the tower would not result in a safety hazard or excessive noise for people residing or working in the Project area. Therefore, there would be no impact.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

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

The County of Riverside Emergency Operations Plan (EOP) (County of Riverside 2019b) serves as the foundation for response and recovery operations for the County of Riverside, as it establishes roles and responsibilities, assigns tasks, and specifies policies and general procedures. The County of Riverside Operational Area Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) (County of Riverside 2023c) aims to reduce the impact of a disaster by identifying hazards and developing ways to decrease their impact. The purpose of the LHMP is to identify the County's hazards, review and assess past disaster occurrences, estimate the probability of future occurrences, and set goals to mitigate potential risks to reduce or eliminate long-term risk to people and property from natural and human-caused hazards.

The proposed Project would construct pipeline within the Gibbel Road and Polly Butte Road right-of-way, and as a result would temporarily block access such that construction activities may conflict with the adopted emergency response plan and emergency evacuation plan (the City EOP and Riverside County LHMP). Implementation of a Traffic Control and Detour Plan (as specified in *Section 2.6 EMWD Standard Construction Practices*) would be required prior to the issuance of an encroachment permit from the County of Riverside. The Plan would require the construction contractor to coordinate with emergency responders on the location of construction and make a reasonable effort to preserve access to adjacent sites and surrounding areas for emergency response crews.

Operations and maintenance required during long-term operation of the Project would be incorporated into EMWD's existing O&M routine. These operational activities would include inspection of the above ground appurtenances and exercise of the valves and would not interfere with an adopted emergency response plan or emergency evacuation plan. Thus, impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

The California Public Resources Code 4201-4204 directs the California Department of Forestry and Fire Protection (CAL FIRE) to map fire hazard within State Responsibility Areas (SRA) based on fuel loading, slope, fire weather, and other relevant factors present, including areas where winds have been identified by the department as a major cause of wildfire spread. These zones, referred to as fire hazard severity zones (FHSZ), classify a wildland zone as Moderate, High, or Very High fire hazard based on the average hazard across the area included in the zone. As shown in **Figure 3-7**, the proposed Project area is designated as a very high fire hazard severity zone (VHFHSZ) within the 2007 Riverside West SRA map (CAL FIRE 2007). However, the proposed Project would not involve the installation or maintenance of infrastructure that is typically associated with fire risk (see *Section 3.20 Wildfire*). Construction and operation of the proposed Project would rely on existing roads and utilities. Installation of the pipelines would occur within existing easements and rights of way, and construction of the replacement pump station would occur within vacant EMWD-owned land. Pump station equipment at the relocated Mission Canyon II Pump Station would be housed in concrete buildings, and a buffer would be maintained around the site, clear of weedy vegetation, to reduce potential wildfire fuel.

Nonetheless, implementation of EMWD's standard fire hazard reduction measures as specified in *Section 2.6* EMWD Standard Construction Practices would ensure the Project would not directly or indirectly expose people or structures to a significant risk of loss, injury or death involving wildlife fire. Impacts would be less than significant.

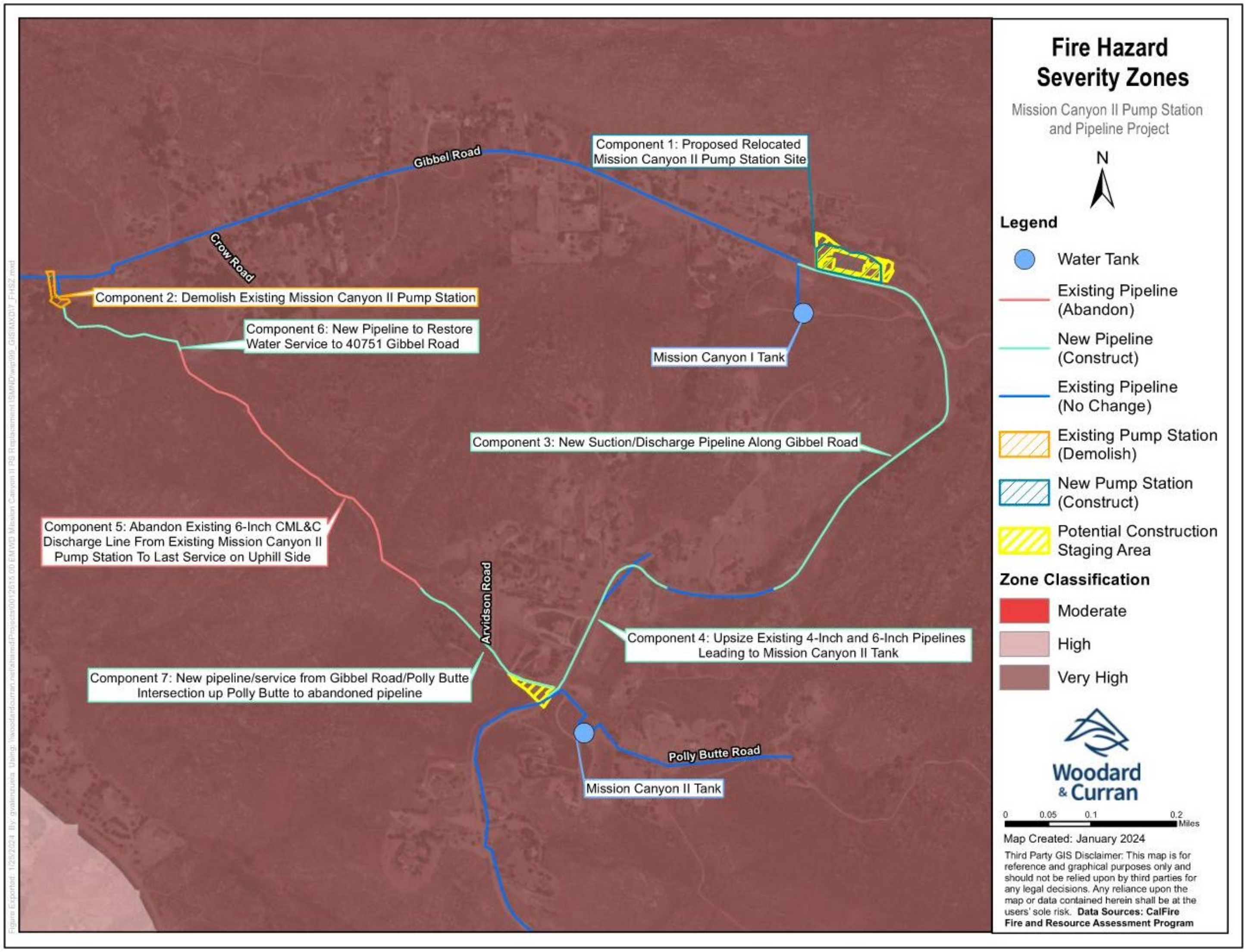
Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

Figure 3-11: Fire Hazard Severity Zones



3.10 Hydrology and Water Quality

	Potentially Significant Impact	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	[ ]	[ ]	[X]	[ ]
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?	[ ]	[ ]	[ ]	[X]
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;	[ ]	[ ]	[X]	[ ]
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	[ ]	[ ]	[X]	[ ]

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	[ ]	[ ]	[X]	[ ]
iv) impede or redirect flood flows?	[ ]	[ ]	[X]	[ ]
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	[ ]	[ ]	[X]	[ ]
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	[ ]	[ ]	[X]	[ ]

Discussion

Surface Water

The Project site is located within the San Jacinto River Watershed, which drains into Canyon Lake. Canyon Lake discharges into Lake Elsinore, and Lake Elsinore discharges into a tributary of the Santa Ana River; however, discharges from these two lakes are rare due to the large amount of flood storage in Lake Elsinore.

The Santa Ana Regional Water Quality Control Board (RWQCB), Region 8, regulates water quality within the Santa Ana River Region. The RWQCB prepares and maintains the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan). The Basin Plan sets water quality standards in the Santa Ana River Basin by establishing beneficial uses for specific water bodies and designating numerical and narrative water quality objectives. Intermittent beneficial uses of the San Jacinto River downstream of the Project area have been identified, and include municipal and agricultural water supply, groundwater recharge, recreation, and freshwater habitat and wildlife uses. Beneficial uses of Canyon Lake and Lake Elsinore include municipal and agricultural supply, recreation, commercial uses, and freshwater habitat and wildlife uses (RWQCB 2019).

The SWRCB also maintains the 303(d) List of Impaired Water Bodies, which identifies water bodies where water quality indicators exceed acceptable thresholds. If a waterbody is placed on the 303(d) list as impaired for one or more pollutants, it will be identified as "listed". Although the Project area does not directly drain to a 303(d)-listed impaired water body, Canyon Lake and Lake Elsinore are listed. Canyon Lake is 303(d)-listed for nutrients; Lake Elsinore is 303(d) listed for DDT (Dichlorodiphenyltrichloroethane), nutrients, organic enrichment/low dissolved oxygen, PCBs (Polychlorinated biphenyls), and toxicity (SWRCB 2022). The RWQCB develops and implements total maximum daily loads (TMDLs) to address water quality impairments and help achieve water quality standards. Water quality is also governed through NPDES stormwater discharge permits issued to municipalities, construction sites, and industrial facilities to control non-point-source pollutants in stormwater discharges to surface waters.

The U.S. Department of Homeland Security Federal Emergency Management Agency (FEMA) identifies flood hazard areas on Flood Insurance Rate Maps prepared for the National Flood Insurance Program. These areas, known as Special Flood Hazard Areas, are defined as areas where there is a one percent chance of flooding in any given year (also referred to as a 100-year flood). FEMA maps also identify moderate flood hazard areas, which are areas outside the one-percent flood area where there is a 0.2 percent chance of flooding in a given year (also referred to as a 500-year flood). Areas outside the 100-year and 500-year flood zones are considered areas of minimal flood hazard. (FEMA 2021).

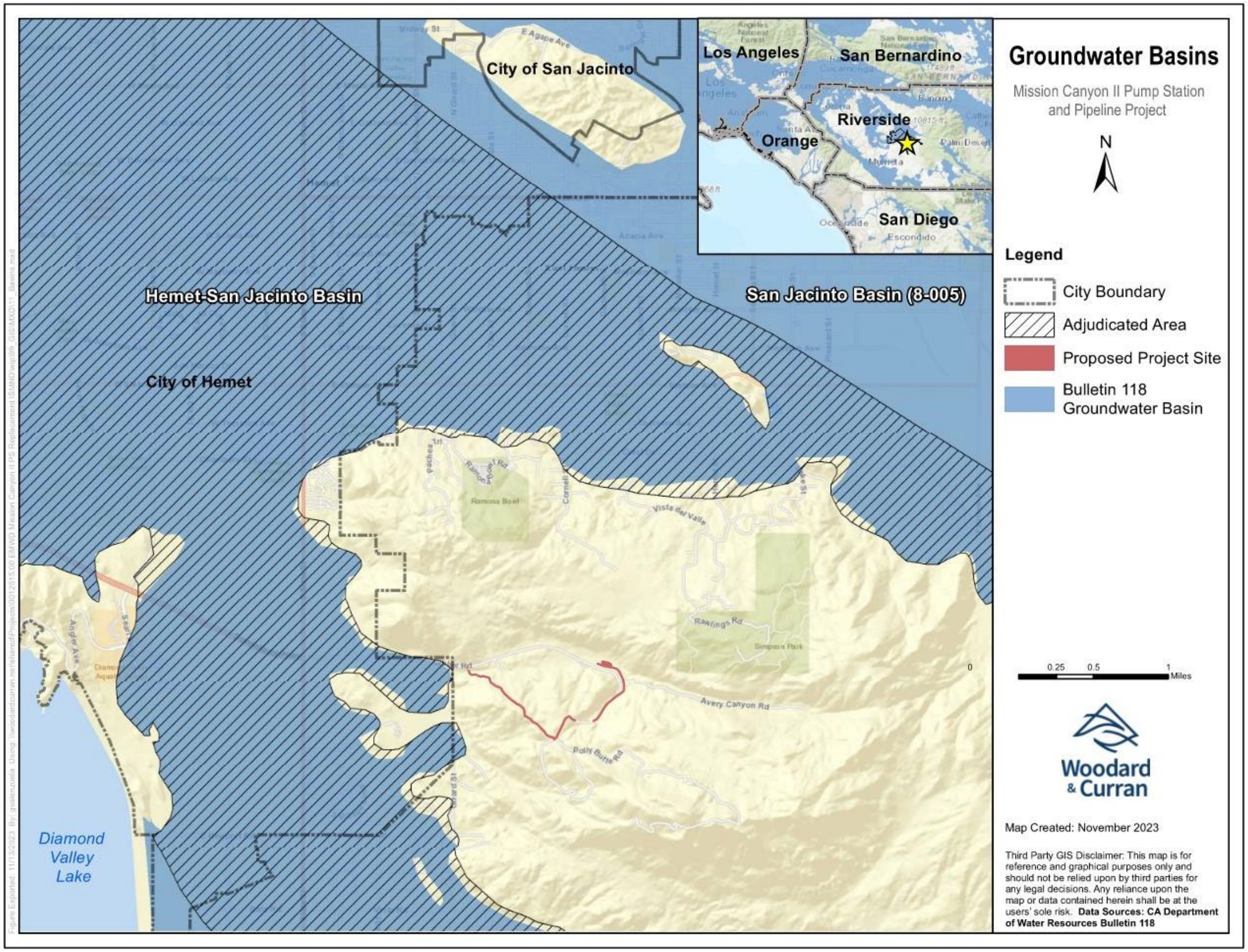
Riverside County Flood Control and Water Conservation District (RCFC) maintains a floodplain mapping tool that shows the projected flood risk within Riverside County. The tool brings together floodplain maps from local, state, and federal agencies and is based on the best available information (RCFC n.d.).

Groundwater

The proposed Project area is located just outside of the Hemet-San Jacinto Basin of the San Jacinto Groundwater Basin (California Department of Water Resources [DWR] Basin Number 8-05) as shown in **Figure 3-8**. The site is underlain by formational materials not generally considered to be water-bearing; however, "trapped" water may be present in weathered areas and within fractures/joints in the bedrock (IFE 2023). Groundwater was encountered in two exploratory borings in the vicinity of the proposed Mission Canyon II Pump Station site at depths of approximately 7 and 14 feet, respectively, below ground surface; groundwater was not encountered in any of the borings along the pipeline alignment, which extended to 10 feet below the existing ground surface (IFE 2023).

Woodard & Curran

Figure 3-12: Groundwater Basins



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

Construction of the proposed Project would disturb an area greater than one acre in size and would therefore be required to obtain coverage under the SWRCB's NPDES Construction General Permit during Project construction. The total disturbance area of the Project is approximately 2.3 acres. As part of the Construction General Permit conditions, EMWD would be required to prepare a SWPPP, which would identify BMPs to control sediment and other construction-related pollutants in stormwater discharges. Typical BMPs include housekeeping practices such as proper waste disposal, covering stockpiles with tarps, containment of building materials, and inspection of construction vehicles to prevent leaks or spills. Contractors would be required to comply with the Construction General Permit throughout construction. Construction dewatering is not anticipated, and all disturbed areas would be returned to pre-construction conditions. Compliance with the Construction General Permit, including implementation of BMPs would ensure construction of the Project would not violate water quality standards or waste discharge requirements, nor significantly degrade surface water or groundwater quality. Construction impacts on surface water quality would be less than significant.

Operation of the proposed Project would not be expected to impact groundwater quality through proper implementation of BMPs and state and local water quality control requirements. Additionally, the Project would not require extraction or recharge of groundwater. Impacts to groundwater quality would be less than significant.

The relocated Mission Canyon II Pump Station would be designed with BMPs to control storm water runoff and water quality. . This would include features such as drainage swales that can help slow runoff and control potential pollutants in storm water discharges from the developed site.

Operation of the proposed Project would not be expected to impact groundwater quality through proper implementation of BMPs and state and local water quality control requirements. Additionally, the Project would not require extraction or recharge of groundwater. Impacts to groundwater quality would be less than significant. .

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

The proposed Project involves primarily the replacement of an existing pump station and construction of new pipelines to correct existing and future hydraulic deficiencies of existing facilities and minimize potential for local hazards to impact facilities. The Project does not involve the extraction, recharge or use of groundwater, and the Project site is not located within the boundaries of a groundwater basin.

As discussed in *Section 3.14 Population and Housing*, the proposed Project would serve existing demand and planned future growth and would not induce population growth or increased water demands. Therefore, the proposed Project would not decrease groundwater supplies or interfere with groundwater recharge efforts and would not impede sustainable groundwater management. There would be no impact.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

c.i) Substantially alter the existing drainage pattern of the site 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: result in substantial erosion or siltation on- or off-site?

The proposed Project would construct approximately 5,400 LF of pipeline within existing roadways and 1,050 LF of pipeline within undisturbed land to restore water service to 40751 Gibbel Road. All disturbed areas would be restored to pre-construction conditions after pipeline installation. Thus, pipeline construction would not result in an increase in total impervious surface area nor increased volumes of storm water runoff. Any crossing of drainage culverts beneath existing roadways would be protected in place (as noted in *Section 2.6 EMWD Standard Construction Practices*) and would not result in alteration of drainages or increases in erosion or siltation.

The replacement Mission Canyon II Pump Station would be constructed adjacent to an existing natural drainage on the north side of the Project site. To avoid flooding from this drainage during large storm events, the building pad for the pump station would be raised by approximately 6 to 8 feet; however, site development would not alter the course of the adjacent drainage. The pump station would change existing conditions at the site from 100 percent pervious surface area to approximately 70 percent pervious with the addition of asphalt and concrete paving around the pump station facilities and driveways off Gibbel Road. However, the site would be designed so that storm water runoff would be directed by new on-site curb and gutters to flow southerly through a rip rap-lined drainage swale on the south side of the facility (away from Gibbel Road), and then flow westerly under the proposed facility access road via an 18-inch reinforced concrete pipe. The pipe would outlet to a gravel area for percolation. In larger storms, site runoff would flow over a rip rap berm into the adjacent natural drainage area. Storm drainage would be designed in accordance with RCFC flood control and water quality requirements and would not result in substantial erosion or siltation on- or off-site.

Project construction may result in disturbance or exposure of soil that could be subjected to erosion and sedimentation during a rain event. However, implementation of BMPs as required by the NPDES Construction General Permit and SWPPP would limit erosion and sedimentation. A hydrology study conducted for the proposed Project (Ardurra 2024) (see **Appendix G)** recommends a scour analysis be conducted for the location where the pump station site overlaps with the floodplain to identify and prevent excessive erosion of the site post-construction (see discussion of the floodplain in *cii*, below). With implementation of the recommendations in the hydrology study, the proposed Project would not alter the existing drainage pattern of the project area in a manner which would result in substantial erosion or siltation on- or off-site. Therefore, the proposed Project would have a less than significant impact.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

c.ii) Substantially alter the existing drainage pattern of the site 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: substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

The Project area is located outside of a FEMA designated 100-year or 500-year flood zone, as identified by the FEMA National Flood Hazard Layer (**Figure 3-9**) According to the hydrology study prepared for the proposed Project by Ardurra (2024) (**Appendix G**), the replacement Mission Canyon II Pump Station site has not been studied by FEMA, so there is no effective FEMA flood insurance study and no established base flood elevation for the proposed pump station site. However, portions of the replacement Mission Canyon II Pump Station site are located within a DWR designated flood zone (**Figure 3-10**).

As discussed in *c.i* above, all disturbed areas would be restored to pre-construction conditions following completion of the pipeline installation and demolition of the existing pump station. Thus, the rate or amount of surface runoff from these Project components would not increase. While construction of the replacement pump station would change existing conditions from 100 percent pervious surface area to approximately 70 percent pervious, the site would be designed so that storm water runoff would be directed to discharge to a gravel area for percolation, and in larger storms, would flow over a rip rap berm and into the adjacent natural drainage area.

Based on the hydrology study prepared for the proposed Project (Ardurra 2024) (**Appendix G**), the increases in site runoff at the pump station site would not be expected to create flooding off-site in downstream areas. They hydrology study found that although the proposed Mission Canyon II Pump Station would alter the floodplain near the site, the new pump station would have no adverse impacts to downstream water surface elevations and no adverse impacts to the downstream culverts during a 100-year storm event. These culverts include two driveway culvert crossings downstream of the proposed replacement pump station site and are each 3.3 feet by 4.3 feet elliptical corrugated metal pipe culverts. The hydrology study recommends the lowest level floor elevation of the pump station site be set at least 1-foot above the calculated 100-year water surface elevation to protect against flooding from storm events greater than the 100-year event. As currently designed, the pump station pad on the site averages 6-feet above the 100-year water surface elevation. Based on the findings of the hydrology study, the proposed Project would not substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site. Impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

Figure 3-13: Federal Flood Zones

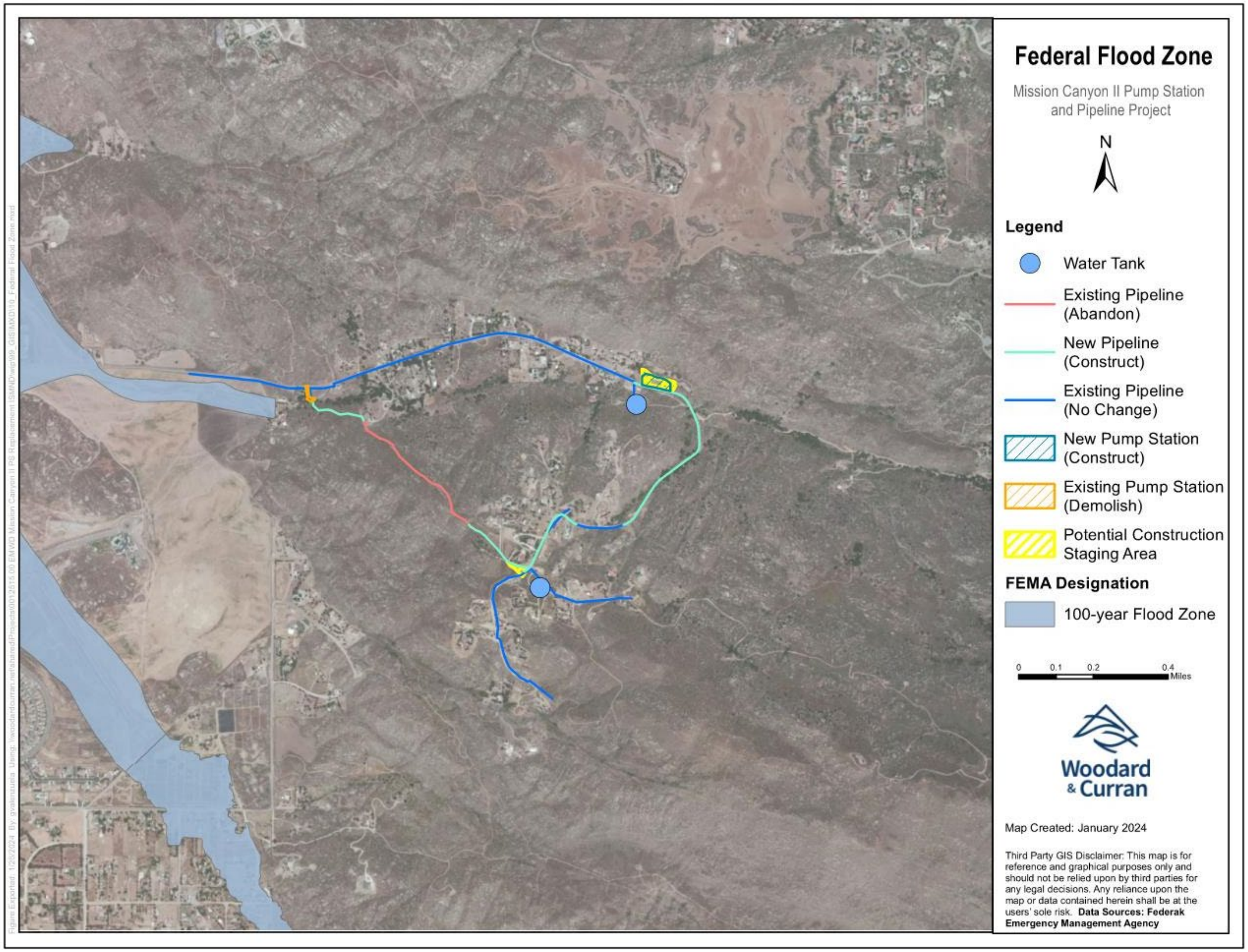
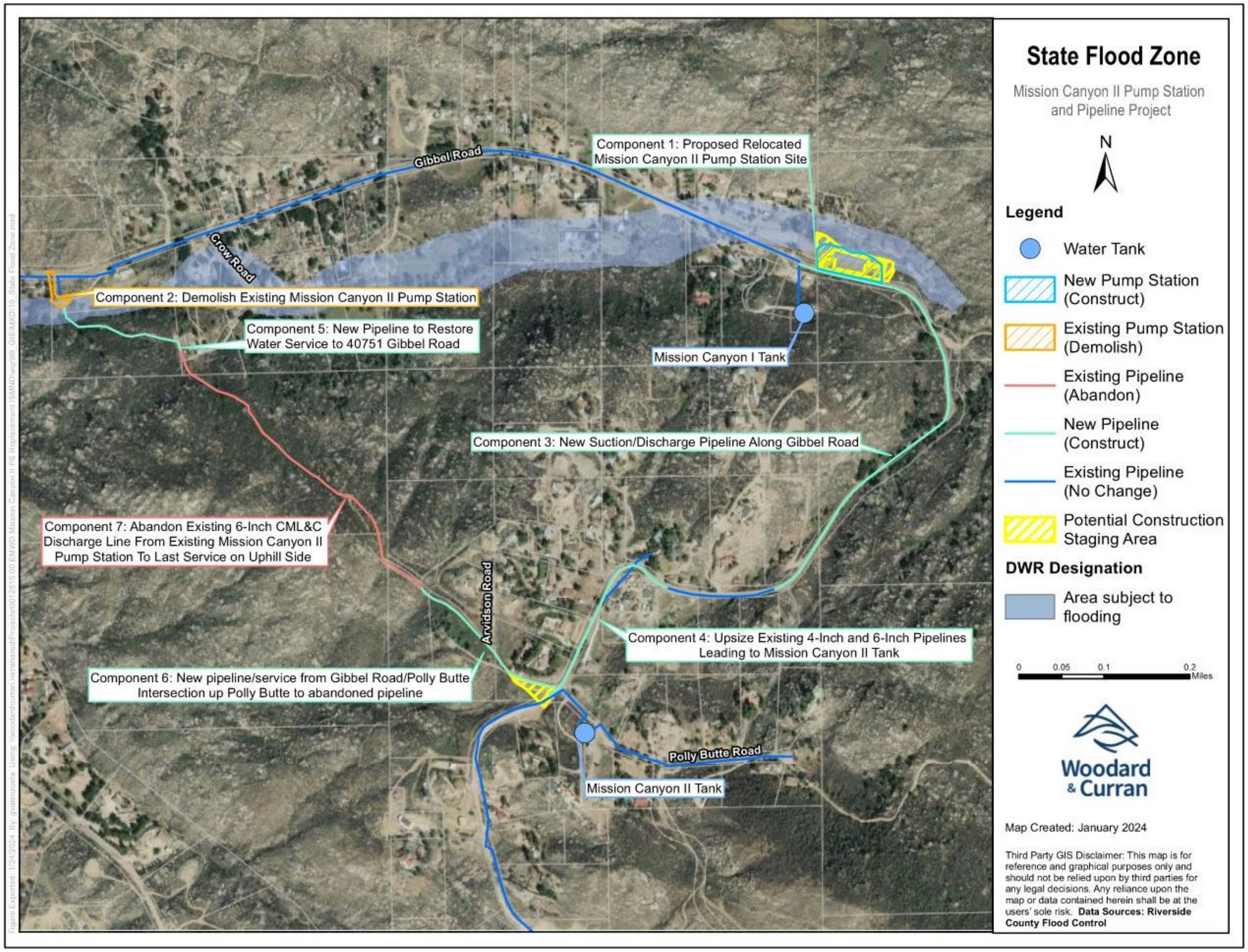


Figure 3-14: State Flood Zones



c.iii) Substantially alter the existing drainage pattern of the site 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: 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?

As discussed in *c.i and cii*, above, the proposed Project would not increase surface runoff or alter existing drainage patterns within the Project area in a manner which would create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. In addition, all construction activities would be conducted in accordance with BMPs specified in the construction SWPPP to reduce pollutants in storm water discharges. Therefore, the proposed Project would have a less than significant impact.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

c.iv) Substantially alter the existing drainage pattern of the site 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: impede or redirect flood flows?

As discussed in *cii,* the replacement Mission Canyon II Pump Station site has not been studied by FEMA, so there is no effective FEMA flood insurance study and no established base flood elevation for the proposed pump station site. Portions of the replacement Mission Canyon II Pump Station site are located within a DWR designated flood zone (**Figure 3-10**).

As discussed in *ci, cii and ciii* above, the replacement Mission Canyon II Pump Station would be constructed on an elevated building pad to prevent potential flooding of the pump station site from the adjacent drainage during large storm events. Also, increases in impervious surface area would result in a slight increase in site runoff that would be controlled through site design features as discussed in response to *ci* above. Based on the hydrology study prepared for the proposed Project (Ardurra 2024) (**Appendix G**), the increases in site runoff at the pump station site as well as the elevated building pad would redirect flows on-site but would not create flooding off-site in downstream areas. Flood flows within the adjacent drainage channel would not be impeded nor be re-directed. Impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

A tsunami is a large ocean wave, caused by earthquakes or major ground movement. The proposed Project site is located approximately 40 miles from the Pacific Ocean; at this distance, a tsunami would not impact the Project vicinity. A seiche is a large wave generated in an enclosed body of water such as a lake, which is also typically caused by an earthquake. Diamond Valley Lake and the San Jacinto reservoir may be at risk to generate flooding during a seismic event, however due to the distance between the reservoirs and the Project site, the potential for inundation at the Project site is low and thus risk of release of pollutants is also low (see **Figure 3-11**). Additionally, as discussed in *Section 3.9 Hazards and Hazardous Materials*, and discussion a) above, the Project requires preparation of a Hazardous Materials Management and Spill Prevention and Control Plan and a SWPPP which would ensure safe handling, transport, and storage of hazardous materials as well as prevention of building material pollutants in storm water runoff. Therefore, the Project site is unlikely to become inundated and the potential for release of pollutants is low. Impacts would be less than significant.

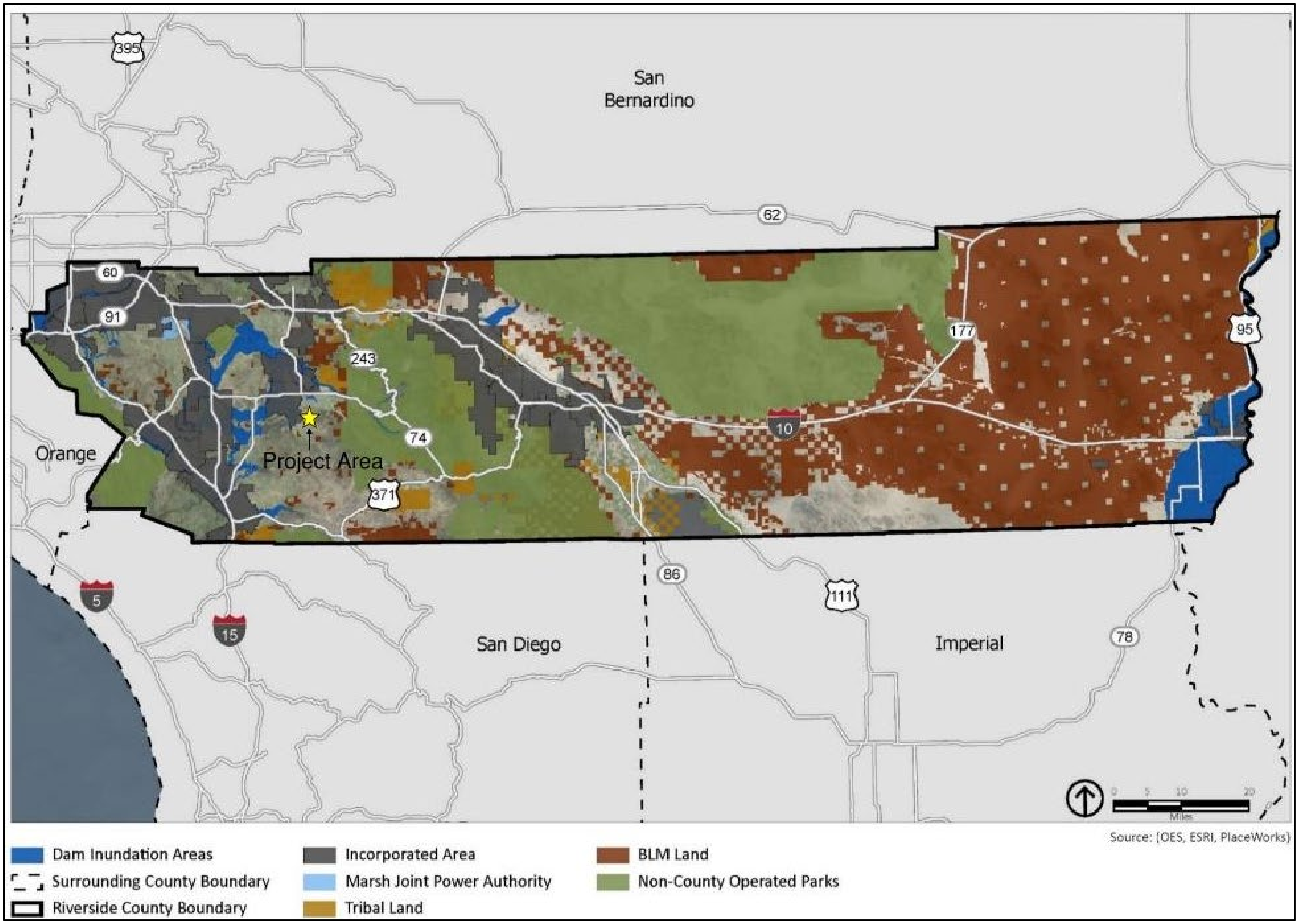
Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

Figure 3-15: Dam Inundation Hazards



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

As noted previously, the Basin Plan sets beneficial uses and water quality objectives for surface water and groundwater in the Project area. The water quality objectives are intended to reduce pollutant discharge and ensure that water bodies are of sufficient quality to meet their designated beneficial uses. The Project would convey potable water for use in EMWD's service area and would not discharge extracted or treated water or be a source of pollutants for downstream water bodies (e.g., San Jacinto River, Canyon Lake, Lake Elsinore).

As discussed in a) above, pollutant discharges to offsite receiving waters during construction would be avoided via compliance with the Construction General Permit and implementation of BMPs specified in the SWPPP. Once operational, the site drainage design would be in compliance with Riverside County drainage and water quality control requirements, and thus minimize pollutant discharges to local receiving waters and help maintain water quality standards. Therefore, the proposed Project would not conflict with the Basin Plan or worsen water quality conditions in any 303(d)-listed water body.

The Project area is located just outside of the boundaries of the adjudicated Hemet-San Jacinto Basin of the San Jacinto Groundwater Basin and is also outside the boundaries of the portion of the San Jacinto Groundwater Basin under management of a Groundwater Sustainability Plan. Operation of the Project would consist of distributing water through the new and replacement pipelines to EMWD's potable water system. The Project does not involve the extraction of groundwater that could affect groundwater levels or quality, nor would result in a significant increase in impervious surface area that could affect groundwater recharge. Therefore, the Project would not conflict with applicable water quality control plans or groundwater management plans. Impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

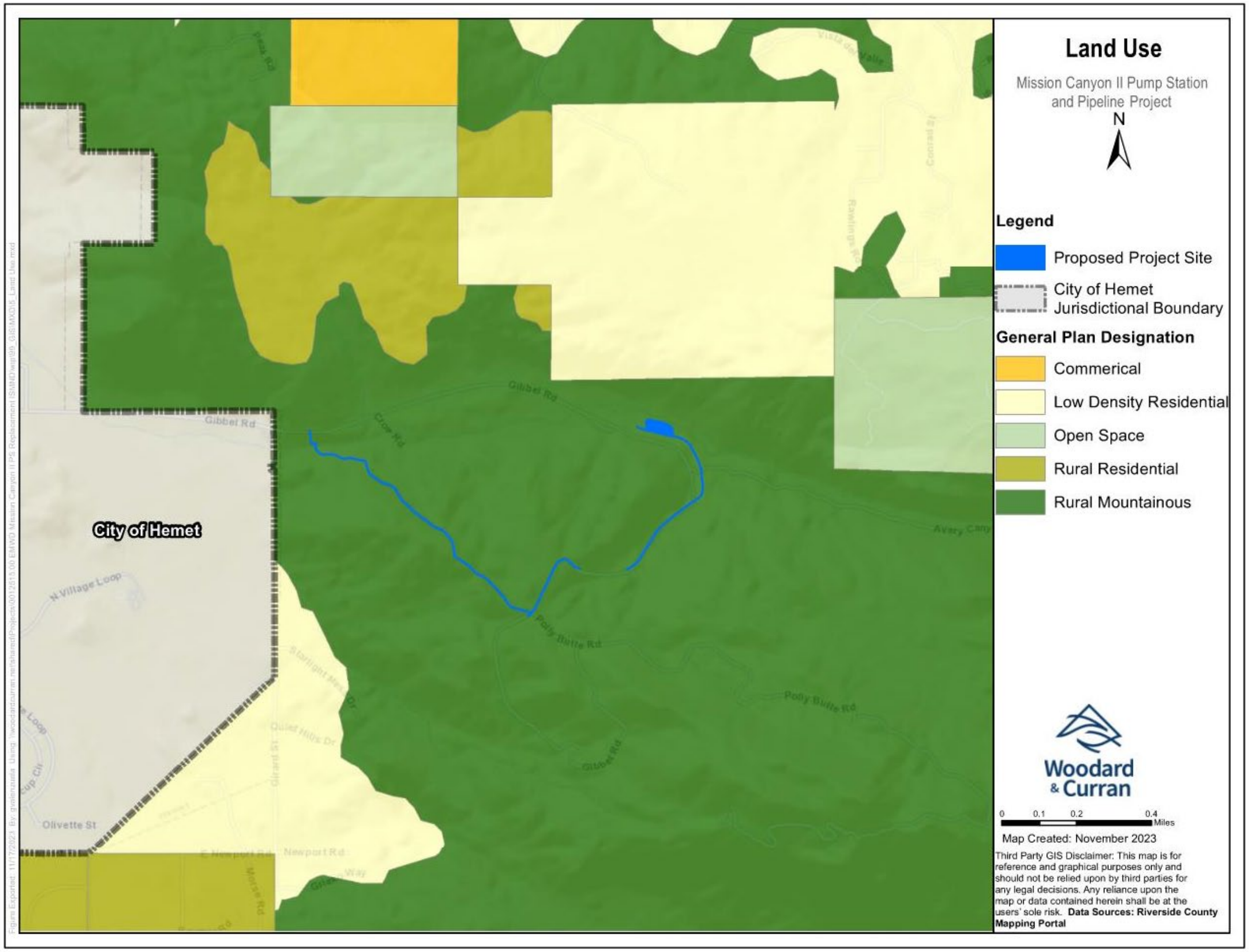
3.11 Land Use and Planning

	Potentially Significant Impact	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Physically divide an established community?	[ ]	[ ]	[X]	[ ]
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	[ ]	[ ]	[ ]	[X]

<u>*Discussion*</u>

The Project area is located within the jurisdictional boundaries of Riverside County According to Riverside County Mapping Portal (County of Riverside 2023d), the Project area is designated as Rural Mountainous land use (see **Figure 3-12**) and zoned RA-Residential Agricultural (see **Figure 3-2**). The Rural Mountainous land use designation allows single family residential uses, limited animal-keeping and agricultural uses, with a maximum residential density of 1 dwelling unit per 10 acres. Additionally, limited recreational uses, compatible resource development (which may include the extraction of mineral resources with approval of a surface mining permit) and associated uses, and governmental uses are allowed within this designation.

Figure 3-16 Riverside County General Plan – Land Use



a) Physically divide an established community?

The new Mission Canyon II Pump Station facility would be constructed on EMWD-owned parcel, and the proposed pipelines would be installed within the rights-of-way of Gibbel Road and a small portion of Polly Butte Road. Potential staging areas would be located in the same EMWD-owned parcel or a turnout of the dirt road near the intersection of Gibbel Road and Polly Butte Road.

Construction of the proposed Project pipelines within roadway rights of way would temporarily reduce access to adjacent residential land uses. Similarly, bicycle access along roadways would be temporarily limited. Any temporary lane closures would be addressed in a Traffic Control and Detour Plan (See *Section 2.6 EMWD Standard Construction Practices*). However, this temporary impact would not physically divide established communities. The Project pipelines would be located below ground and disturbed areas would be restored to pre-construction conditions. Demolition of the existing pump station and abandonment of the existing pipeline would occur outside roadways, and disturbed areas would be restored to their pre-construction conditions. The replacement Mission Canyon II Pump Station would be constructed on a vacant disturbed parcel, outside an established residential neighborhood. The temporary construction staging areas would potentially be located on a vacant EMWD-owned parcel or a turnout dirt road.

While the proposed Project would temporarily limit vehicle and bicycle circulation on local roads due to lane closures during construction, the Project would not permanently divide an established community. Therefore, the proposed Project would have a less than significant impact.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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?

The proposed Project would demolish and replace the existing Mission Canyon II Pump Station, construct new pipelines, and abandon existing pipelines to improve water supply reliability in unincorporated areas in EMWD's service area. The new pump station would be constructed on an EMWD-owned parcel and new pipelines would be constructed on the Gibbel Road right-of-way and a small portion of Polly Butte Road. The Project area would be returned to pre-construction conditions after construction is completed.

The replacement Mission Canyon II Pump Station would occupy a footprint of roughly 1.5 acres and would prevent the land use parcel from being developed for its planned land use (residential). However, under the Riverside County General Plan, government facilities (such as the proposed pump station) would be permitted at the site under the Residential-Agricultural land use designation. Therefore, the proposed Project would not conflict with the land use policies of the Riverside County General Plan.

No components of the Project site are located within existing or proposed criteria cells or reserves defined in the Western Riverside MSHCP (RCA n.d.). The proposed Project would not impact wildlife movement corridors and habitat linkages because the Project would be developed within roadways and adjacent, disturbed parcels. Therefore, the Project would not conflict with applicable land use plans, policies, or regulations intended to avoid or mitigate an environmental effect. No impact would occur.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

3.12 Mineral Resources

Would the Project:	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
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?	[ ]	[ ]	[X]	[ ]

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?	[ ]	[ ]	[X]	[ ]

Discussion

The Surface Mining and Reclamation Act of 1975 (SMARA) mandates a process for classification and designation of lands containing potentially important mineral deposits. Classification is conducted by the California Geological Survey (CGS) State Geologist and designation is a function of the CGS State Mining and Geology Board. The relative importance of potential mineral resource sites is indicated through classification into Mineral Resource Zones (MRZs). These MRZs are based on geological appraisals which include the use of literature, geological maps, and publications and data from the CDOC Division of Mines and Geology, US Geological Survey, the former US Bureau of Mines, and the US Bureau of Land Management. It also includes site investigations that determine the chemical and physical components of the area. An area can be classified as:

MRZ 1: No mineral resources;

MRZ 2: Significant resource area (quality and quantity known);

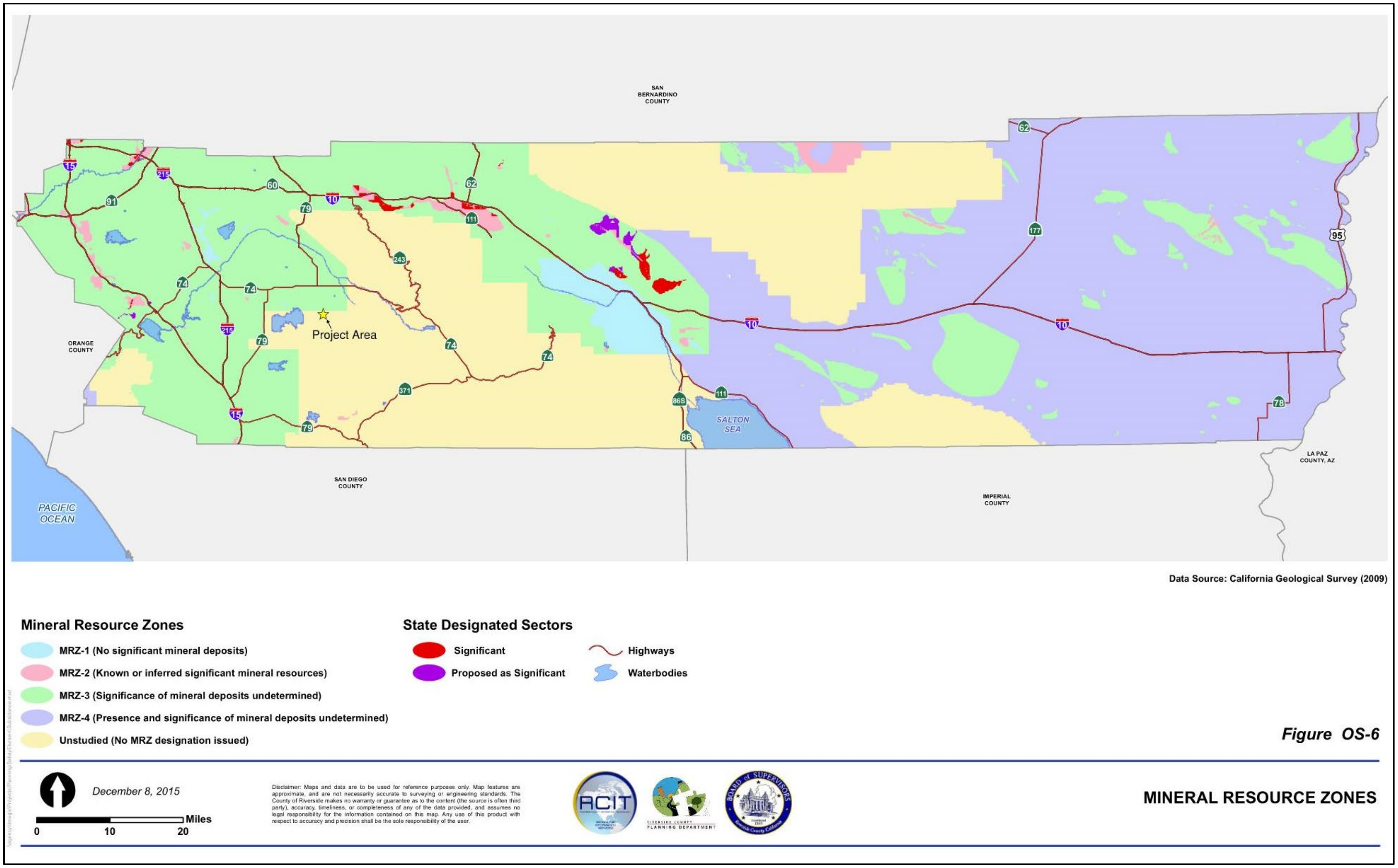
MRZ 3: Significant resource area (quality and quantity unknown);

MRZ 4: No information (applies primarily to high-value ores).

The proposed Project area is located within unincorporated Riverside County, east of the City of Hemet and designated as "unstudied/no MRZ" (**Figure 3-13**) by the Riverside County General Plan Multipurpose Open Space Element (County of Riverside 2015a). There are no active mines in the Project area (CDOC n.d.).

Woodard & Curran

Figure 3-17: Riverside County General Plan – Mineral Resources Zones



a-b) 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? 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?

Special Report 206 titled *Update of Mineral Land Classification for Portland Cement Concrete-Grade Aggregate in the San Bernardino Production-Consumption Region, San Bernardino and Riverside Counties, California* (CDOC 2022c) designates the Project area as an area containing known or inferred mineral occurrences of undetermined mineral resource significant. The Project is a relatively small infrastructure improvement in the Project area, requiring construction in existing roadways and on a 1.5-acre vacant parcel zoned for Residential Agriculture. The project is not expected to create significant impacts on the availability of a valuable mineral resource in the region. Additionally, the proposed Project area is not currently used as a mineral resource recovery site and the proposed Project would not involve mining or the production of mineral resources. No impact on the availability of a known mineral resource or the availability of a locally-important mineral resource recovery site would occur as a result of construction or operation of the proposed Project. Overall, impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

3.13 Noise

	Potentially Significant Impact	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of	[ ]	[X]	[ ]	[ ]

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

Discussion

Noise is generally defined as unwanted sound. Noise can cause hearing impairment for humans, and may also disrupt everyday activities such as sleep, speech, and activities requiring concentration. Noise can also interfere with the activities of wildlife, especially nesting birds. Noise-sensitive land uses are generally those where excess noise would disrupt how humans and/or wildlife use the land. Land uses such as schools, churches, and hospitals would typically be considered noise sensitive. Noise may be generated by mobile (i.e., line) sources (for example, cars, trains, and aircraft) or stationary (i.e., point) sources (for example, machinery, airports, and construction sites).

This analysis uses the following noise metrics:

- A decibel (dB) is a unit for measuring the relative amplitude of a sound equal to the smallest difference normally detectable by the human ear, the range of which includes approximately one hundred thirty (130) decibels on a scale beginning with zero decibels for the faintest detectable sound.
- A-weighting (dBA) means the standard A-weighted frequency response of a sound level meter, which de-emphasizes low and high frequencies of sound in a manner similar to the human ear for moderate sounds.

- Community Noise Equivalent Level (CNEL) is the average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five decibels to sound levels in the evening from 7pm to 10pm and after the addition of 10 decibels to sound levels in the night from 10pm to 7am. Day-Night Average Level (Ldn) is the average equivalent A-weighted sound level during a 24-hour day, obtained after addition of 10 decibels to sound levels in the night from 10pm to 7am. CNEL and Ldn both represent daily levels of noise exposure averaged on an annual or daily basis (County of Riverside 2015).

A series of land uses have been deemed noise sensitive land uses by the State of California. These land uses require a serene environment as part of the overall facility or residential experience. Many of these facilities depend on low levels of sound to promote the wellbeing of the occupants. These uses include, but are not necessarily limited to schools, hospitals, rest homes, long term care facilities, mental care facilities, residential uses, places of worship, libraries, and passive recreation areas (County of Riverside 2015).

Groundborne vibration may occur when heavy equipment or vehicles create vibrations in the ground, which can then propagate through the ground to buildings, creating a low-frequency sound. Groundborne vibration can be described by both its amplitude and frequency. Amplitude may be characterized by particle velocity, which is measured in inches or millimeters per second. Vibration can be felt outdoors, but the perceived intensity of vibration impacts is much greater indoors, due to the shaking of the structure. Groundborne vibrations can be a source of annoyance to humans due to a "rumbling" effect, and such vibrations may also cause damage to buildings. Groundborne vibration is discussed in terms of these impacts on humans and structures. The annoyance potential of groundborne noise is typically characterized by the A-weighted sound level. Common sources of vibration come from trains, transit vehicles, construction equipment, airplanes, and large vehicles. Land uses sensitive to vibration will have a lower vibration threshold. The following vibration terminology have been adapted from the FTA's *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018):

- Peak Particle Velocity (PPV). The peak signal value of an oscillating vibration velocity waveform. Usually expressed in inches/second in the United States.
- Vibration Decibels (VdB). The vibration velocity level in decibel scale.

The Riverside County General Plan Noise Element (County of Riverside 2015b) provides a systematic approach to identifying and appraising noise problems in the community; quantifying existing and projected noise levels; addressing excessive noise exposure; and community planning for the regulation of noise. The element includes policies, standards, criteria, programs, diagrams, a reference to action items, and maps related to protecting public health and welfare from noise (**Table 3-9**).

Table 3-9: County of Riverside Land Use Compatibility for Community Noise Exposure

Land Use Category	Range of "Normally Acceptable" Community Noise Exposure Level (L_{dn} or CNEL, dBA)					
	55	**60**	**65**	**70**	**75**	**80**
Residential-low density single family, duplex, mobile homes						
Residential-multiple family						
Transient lodging-motels, hotels						
Schools, libraries, churches, hospitals, nursing homes						
Playgrounds, neighborhood parks						
Golf courses, riding stables, water recreation, cemeteries						
Office buildings, businesses, commercial, and professional						
Industrial, manufacturing, utilities, agriculture						

Source: County of Riverside 2015b.

Riverside County Ordinance No. 847 Regulating Noise establishes countywide standards regulating noise and regulates noise in order to protect the health, safety, and general welfare of Riverside County residents. According to Ordinance 847, sound emanating from capital improvement projects of a government agency are exempt from the provisions of the ordinance. Therefore, the sound levels set in the County of Riverside Noise Ordinance would not apply to the proposed Project. However, sound levels can be used to understand acceptable sound levels in the region. The ordinance stipulates that sound levels shall not exceed the exterior sound level standards at neighboring property lines shown in **Table 3-10** for the Rural Mountainous land use designation.

Table 3-10: County of Riverside Sound Level Standards

General Plan Land Use Designation of Proposed Project	Maximum Decibel Level (dB L_{MAX})	
	7am – 10pm	**10pm – 7am**
Rural Mountainous	45	45

Source: County of Riverside 2006.

EMWD has not established an applicable noise standard of its own for permanent or temporary ambient noise levels, however EMWD follows a "good neighbor" approach to adhering to local noise standards. Thus, the Riverside County General Plan noise standards are used for the purposes of evaluating the significance of the Project's noise levels in this CEQA analysis.

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

Construction

The Project has the potential to expose people to increased noise levels resulting from construction equipment and vehicles and long-term operation of the relocated Mission Canyon II Pump Station. The Project area is zoned Residential Agricultural by the County of Riverside and (**Figure 3-2**) designated Rural Mountainous by the Riverside County General Plan (**Figure 3-12**). Single-family residences are the primary noise-sensitive receptors adjacent to, and in the vicinity, of the Project site.

Construction of the relocated Mission Canyon II Pump Station would occur within an EMWD-owned parcel, and is anticipated to last four months. Construction activities would include site preparation, grading, building construction, equipping, and paving. Noise-generating equipment to be used during construction of the pump station is listed in **Table 2-1** in *Section 2.4.5 Construction Equipment*. The existing features at the relocated Mission Canyon II Pump Station site include large trees to the west and a road to the south, which would provide a minor attenuation of noise between the proposed pump station site and the nearest residences located approximately100 feet and 400 feet to the southwest and west, respectively. There are no residences to the north or east of the relocated pump station site.

Demolition of the existing pump station would occur within an EMWD-owned parcel, and is anticipated to last approximately one to two weeks. Demolition activities would primarily include excavation, saw cutting, and backfill. Noise-generating equipment to be used during demolition of the pump station is listed in **Table 2-2** in *Section 2.4.5 Construction Equipment*. The existing pump station site includes large trees to the west which would provide a minor attenuation of noise between the pump station site and the nearest residences, located approximately 100 feet to the west.

Construction of the pipelines would occur primarily within roadway rights-of-way as shown in **Figure 2-2**, and is anticipated to last 16 weeks. Construction activities would include saw cutting of the pavement, trench excavation, trench backfill and compaction, and site restoration/pavement replacement. Noise-generating equipment used during pipeline construction is listed in **Table 2-2** in *Section 2.4.5 Construction Equipment*. Pipeline construction is expected to occur at a rate of 50 linear feet per day. Therefore, construction noise impacts at any one receptor would be of short duration as construction would move along the pipeline alignment until it is completed. The pipeline alignment would be located in the existing roadway rights-of-way. Single family homes along the pipeline alignment are typically setback at least 50 feet from the roadway right of way. The existing CML&C discharge line would be abandoned in place. No pipe would be removed, and no construction equipment would be required.

In addition to the generation of on-site equipment noise, truck trips associated with the transportation of workers, equipment and materials would generate noise along local streets which could impact adjacent and nearby residences. The amount of noise generated by temporary construction activities is affected by the vehicle speed, load, road condition, and other factors.

Construction of the overall Project is conservatively estimated to last approximately 386 working days and construction activities would result in temporary noise increases. Construction noise levels would fluctuate depending on the Project component, construction phase, equipment type, duration of use, distance between noise source and receptor, and presence or absence of existing barriers between noise source and receptor. The typical noise level of each piece of equipment included in *Section 2.4.5 Construction Equipment* is listed in **Table 3-11**.

Table 3-11: Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level 50ft from Source, dBA
Backhoe/Loader	80
Air Compressor	80
Concrete Pumper	82
Concrete Saw	N/A[1]
Crane	83
Dump Truck	84[2]
Generator	82
Excavator	80[3]
Forklift	N/A[1]
Pavement Breaker	88[4]
Paver	85
Pump	77
Sweeper	N/A[1]
Utility Truck	84[2]
Water Truck	84[2]
Welder	74[1]

Source: FTA 2018

Notes:

1. No noise level was reported
2. Noise level was assumed to be comparable to "truck"
3. Noise level was assumed to be comparable to "backhoe"
4. Noise level was assumed to be comparable to "jackhammer"

Residences adjacent to the Project sites have the potential to be exposed to construction generated noise which could exceed the maximum exposure level standards established in the County of Riverside General Plan Noise Element and County of Riverside Noise Ordinance 847 shown in **Table 3-9** and **Table 3-10**, respectively. Although the proposed Project is exempt from Riverside County Noise Ordinance standards, the construction would occur during daytime hours only, consistent with the limits on private construction activities in the Noise Ordinance. Additionally, EMWD would require the Project contractor to implement **Mitigation Measure NOI-1**, which includes a number of BMPs to control and reduce noise. With construction limited to daytime hours and with implementation of **Mitigation Measure NOI-1,** construction noise impacts would be less than significant.

Operation

Once operational, the below-ground conveyance pipelines would not generate noise. Operation of the replacement Mission Canyon II Pump Station involves the use of pumps and an air compressor which typically generate 77 and 80 dBA of noise, respectively, at a distance of 50 feet (see **Table 3-11**). To provide noise attenuation, all equipment would be housed within a concrete block pump station building and generator building, which would be designed and constructed for noise control (see *Section 2.4.1 Project Description)* . In addition, the replacement pump station site would be surrounded by an 8-foot-tall concrete masonry unit perimeter block wall, which would provide additional noise attenuation. With shielding from the pump station and generator buildings, 8-foot concrete masonry unit wall, as well as attenuation due to distance from nearest residential receptors (100 feet to the southwest and 400 feet to the west), noise from operation of the replacement pump station would be less than significant. Operation and maintenance of the pipelines would be incorporated into EMWD's existing operation and maintenance activities; no new significant vehicle use or associated noise would result from the proposed Project. Long-term noise associated with these minor additional vehicle trips would not result in a noticeable increase in permanent ambient noise above existing levels. With the environmental commitments and project design features, operational noise from the proposed facilities would be less than significant.

Mitigation Measures

NOI-1 Construction Noise Reduction Measures

EMWD shall require its contractor to implement the following actions relative to construction noise:

- EMWD shall conduct construction activities Monday through Friday between the hours of 7:00 AM and 6:00 PM.
- Prior to construction, EMWD, in coordination with the construction contractor, shall provide written notification to all properties within 50 feet of the proposed Project facilities informing occupants of the type and duration of construction activities. Notification materials shall identify a method to contact EMWD's program manager with noise concerns. Prior to construction commencement, the EMWD program manager shall establish a noise complaint process to allow for resolution of noise problems. This process shall be clearly described in the notifications.
- Stationary noise-generating equipment shall be located as far from sensitive receptors as possible. Such equipment shall also be oriented to minimize noise that would be directed toward sensitive receptors. Whenever possible, other non-noise generating equipment (e.g., roll-off dumpsters) shall be positioned between the noise source and sensitive receptors.

- Equipment and staging areas shall be located as far from sensitive receptors as possible. At the staging location, equipment and materials shall be kept as far from adjacent sensitive receptors as possible.
- Construction vehicles and equipment shall be maintained in the best possible working order; operated by an experienced, trained operator; and shall utilize the best available noise control techniques (including mufflers, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds).
- Unnecessary idling of internal combustion engines shall be prohibited. In practice, this would require turning off equipment if it would idle for five or more minutes.
- Electrically powered equipment shall be used instead of pneumatic or internal combustion powered equipment, where feasible.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.

Significance Determination

Less than significant impact with mitigation incorporated.

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

Construction activities associated with the proposed Project would have the potential to generate low levels of groundborne vibration. Groundborne vibrations propagate through the ground and decrease in intensity quickly as they move away from the source. **Table 3-12** displays the human reaction to typical vibration levels.

Table 3-12: Human Reaction to Typical Vibration Levels

Vibration Level Peak Particle Velocity (inches/second)	Human Reaction
0.0059-0.0188	Threshold of perception, possibility of intrusion
0.0787	Vibrations readily perceptible
0.0984	Continuous vibration begins to annoy people
0.1968	Vibrations annoying to people in buildings
0.3937-0.5905	Vibrations considered unpleasant when continuously subjected and unacceptable by some walking on bridges

Source: County of Riverside 2015b

The *Transit Noise and Vibration Impact Assessment Manual* provides average source levels for typical construction equipment that may generate groundborne vibrations.; vibration source levels for construction equipment associated with the proposed Project are summarized in **Table 3-13**. None of the construction equipment to be used would exceed the readily perceptible vibration level at a distance of 25 feet, which is closer than Project construction would be to adjacent residences along the pipeline alignment.

Table 3-13: Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 feet (inches/second)	Approximate VdB at 25 feet
Backhoe/Loader	N/A	N/A
Air Compressor	N/A	N/A
Concrete Pumper	N/A	N/A
Concrete Saw	N/A	N/A
Crane	N/A	N/A
Dump Truck	0.076[1]	86[1]
Generator	N/A	N/A
Excavator	N/A	N/A
Pavement Breaker	0.035[2]	79[2]
Paver	N/A	N/A
Pump	N/A	N/A
Sweeper	N/A	N/A
Utility Truck	0.076[1]	86[1]
Water Truck	0.076[1]	86[1]
Welder	N/A	N/A

Source: FTA 2018

Most construction equipment is not expected to generate vibration; these are denoted with "N/A."

1. Vibration level was assumed to be comparable to "loaded trucks"
2. Vibration level was assumed to be comparable to a "jackhammer"

According to the FTA's *Transit Noise and Vibration Impact Assessment Manual*, 80 VdB is the threshold for human annoyance from groundborne vibration noise when events are infrequent. The proposed Project would not involve use of high-impact activities, such as piledriving or blasting, that typically generate significant levels of groundborne vibration. However, loaded trucks would produce levels of vibration noise that exceed the threshold for human annoyance at a distance of 25 feet. Groundborne vibration noise from the most impactful piece of equipment (loaded truck) would attenuate to below 80 VdB at a distance of 40 feet ($VdB_{distance} = VdB_{reference} - 30\log(distance/25)$) (FTA 2018). Vibration noise from trucks would attenuate to below 80 VdB at a distance of 40 feet.

Pipeline construction would require the use of loaded trucks which have the potential to generate groundborne vibration above 80 VdB at residences located within 40 feet. Vibrations associated with pipeline construction would occur infrequently and would be short in duration. Additionally, pipeline construction would move along the alignment at a rate of 50 linear feet per day and would not remain in the same location for an extended period of time; therefore, sensitive receptors near the pipeline alignment would not experience vibrations for the entire duration of Project construction. Groundborne vibration and noise tends to be more perceptible and disruptive during nighttime hours when people are generally indoors and asleep. Pipeline construction would only occur during daytime hours and would therefore avoid impacts during the night when they would be more likely to be noticed. Once operational, the pipeline would not produce groundborne vibration or groundborne noise.

Construction of the relocated Mission Canyon II Pump Station and demolition of the existing pump station would require the use of loaded trucks that could generate intermittent groundborne vibration noise. However, construction would be limited to daytime hours, and adjacent residences would be greater than 25 feet from construction activities, the distance at which groundborne vibration would dissipate to less than readily perceptible levels. Therefore, groundborne vibration noise generated during construction and demolition activities would not meet the threshold for human annoyance. Once operational, the pump station would not produce groundborne vibration noise.

Construction of the proposed Project may generate low levels of vibration noise; that would be infrequent, temporary, and short in duration. Vibration and vibration noise would not be damaging or excessive, therefore the impact would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

There are no private, public, or military airports within 2 miles of the proposed Project area and the Project area is not within an airport land use plan. The nearest airport, the Hemet-Ryan Airport, is located approximately 5 miles northwest of the Project area. Therefore, the Project would not expose residences or workers to excessive aircraft noise and there would be no impact.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

3.14 Population and Housing

Would the Project:	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	[ ]	[ ]	[ ]	[X]
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	[ ]	[ ]	[ ]	[X]

Discussion

In 2020, EMWD served an estimated retail population of 603,950 through approximately 155,561 single family, multi-family, and other commercial, industrial, institutional, landscape, and irrigation accounts. EMWD's service area is currently 40 percent built out, making it one of the few regions in Southern California that will see significant population growth in the coming decades (EMWD 2021). Ultimate demand estimates indicate that before EMWD reaches build out, the population will more than double compared to the current size. As planned for in the EMWD 2020 Urban Water Management Plan (UWMP), EMWD's retail service area population will increase to approximately 807,200 in 2045 (EMWD 2021).

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

The proposed Project would not directly induce unplanned population growth because no new housing or permanent employment are proposed. The proposed Project involves the construction and operation of a new pump station and associated pipelines to address hydraulic capacity issues of the existing Mission Canyon II Pump Station and improve water supply reliability in the region. Operation of the Project would supply existing and projected water demand and is consistent with the planned growth anticipated in the 2020 UWMP. Inspection and repair, if necessary, of the proposed Project would be incorporated into EMWD's existing O&M activities; no new staff would be required to serve the Project. Therefore, the proposed Project would not directly or indirectly induce unplanned population growth and no impact would occur.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

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

Construction and operation of the Project would occur within an EMWD-owned parcel and within the existing rights of way of Gibbel Road and Polly Butte Road. Potential construction staging area would occur within an EMWD-owned parcel or turnout of a dirt road. The Project would not displace existing people or houses or require the construction of replacement housing. Therefore, no impact would occur.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

3.15 Public Services

Would the Project:	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
i) Fire protection?	[ ]	[ ]	[ ]	[X]
ii) Police protection?	[ ]	[ ]	[ ]	[X]
iii) Schools?	[ ]	[ ]	[ ]	[X]
iv) Parks?	[ ]	[ ]	[ ]	[X]
v) Other public facilities?	[ ]	[ ]	[ ]	[X]

Discussion

Fire Protection

Riverside County Fire Department and CAL FIRE provide public safety services, including fire protection, medical aid, rescue, hazardous materials response, and educational safety programs in Riverside County. Riverside County Fire Station 26, located at 25954 Stanford Street, is the closest fire station to the Project area (County of Riverside n.d.).

Police Protection

Riverside County Sheriff's Department Hemet Station, located at 43950 Acacia Avenue, Suite B, provides police protection and crime prevention services within the Project area.

Schools

There are no schools within the Project area. McSweeney Elementary School (451 Chambers Street) and Hemet High (41701 E. Stetson Ave) are approximately 2 miles from the Project area. The two schools are within the Hemet Unified School District (HUSD), which operates 16 elementary schools, seven middle schools, five high schools, and five alternative schools (HUSD n.d.).

Parks

Riverside County incorporates a wide range of open space, parks, and recreational areas, including Joshua Tree National Park and major state parks such as Anza-Borrego, the Salton Sea State Recreation Area, and Chino Hills State Park. A variety of county parks also serve residents and visitors in the western portion of Riverside County, as well as in the desert, mountain, and Colorado River regions. Riverside County maintains 35 Regional Parks, encompassing roughly 23,317 acres (County of Riverside 2015a). Simpson Park, located approximately 1.5 miles from the Project area, is the nearest park to the Project area. Simpson Park is one of 10 parks and facilities maintained by the City of Hemet (City of Hemet n.d.).

Other Public Facilities

Hemet Library is located at 300 E Lathan Ave., approximately 4 miles from the Project area. The Riverside County Library System has a smaller branch library in Valle Vista (25757 Fairview), which is approximately 9 miles from the Project area. The Hemet Global Medical Center (1117 E Devonshire) is the closest hospital, located approximately 5.5 miles from the Project area.

a.i) 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 following public services: Fire protection?

The proposed Project would not construct new or physically alter existing fire protection facilities, nor would it substantially change response times or service ratios for fire protection facilities. Fire protection requirements during construction of the proposed project would be short-term, and existing fire protection services provided by Riverside County/CAL FIRE would be sufficient to provide fire or emergency to the proposed Project site. In addition, operation of the proposed Project would not directly or indirectly induce unplanned population growth that would require construction of new fire departments or expansion of fire protection facilities. No additional or increased fire protection facilities to maintain response times, service ratios, or other measures of performance would be required. Therefore, no impact on fire protection service facilities would occur.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

a.ii) 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 following public services: Police protection?

The proposed Project would not construct new or physically alter existing police protection facilities, nor would it substantially change response times or service ratios for police services and stations. In the event of an emergency, existing police services provided by the Riverside County Sheriff's Department would be sufficient. In addition, operation of the proposed Project would not directly or indirectly induce unplanned population growth that would require construction of a new or expansion of the existing police station to maintain response ratios, service ratios, or other measures of performance. Therefore, no impact on police service facilities would occur.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

a.iii) 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 following public services: Schools?

The proposed Project would not change existing demand for schools because the Project would serve existing and planned communities. Construction of the proposed Project does not include housing, and operation would not result in new employment or population growth that would result in an influx of students. No new school facilities would need to be built to maintain class size ratios or other performance objectives. As a result, no impact on school facilities would occur.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

a.iv) 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 following public services: Parks?

The proposed Project would not change existing demand for parks or recreational facilities because the Project does not propose new housing units, nor would it directly or indirectly induce population or employment within the area. Construction and operation of the Project would not necessitate expansion of existing or construction of new parks or recreational facilities to maintain the park ratio standard. Therefore, no impact on parks or recreational facilities would occur.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

a.v) 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 following public services: Other public facilities?

The proposed Project would not change existing demand for other public facilities because the Project does not propose new housing units, nor would it directly or indirectly induce population or permanent employment within the area. Construction and operation of the Project would not necessitate expansion of existing or construction of new public facilities such as libraries or hospitals. Therefore, no impact on other public facilities would occur.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

3.16 Recreation

Would the Project:	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
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?	[ ]	[ ]	[X]	[ ]
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?	[ ]	[ ]	[ ]	[X]

<u>*Discussion*</u>

As described in *Section 3.11 Land Use and* Planning, the Project area is located within a Rural Mountainous land use designation of Riverside County General Plan. As discussed under *Section 3.15 Public Services*, there are no parks or recreational facilities within the Project area. There are no trails or bikeways within the Project area.

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?

The proposed Project would serve existing and planned communities. The proposed Project does not include residential housing and would not induce permanent employment or population growth that would permanently increase the use of parks and recreational facilities. Construction of the proposed Project may require temporary closure of the bike lane along Gibbel Road. Potential impacts related to this closure would be minimized through the implementation of a Traffic Control and Detour Plan as specified in *Section 2.6 EMWD Standard Construction Practices*). Implementation of a Traffic Control and Detour Plan would ensure potential temporary impacts related to closures of pedestrian and bicycle access routes are less than significant. In addition, bicycle lanes that would be temporarily impacted during construction would be restored upon the completion of construction. The Project would not increase the use of existing parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated. Therefore, the Project would have a less than significant impact.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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?

The proposed Project would construct a replacement pump station and associated potable water distribution pipelines to correct existing hydraulic deficiencies and serve existing and planned future development. The Project would not require construction or expansion of recreational facilities which could have an adverse physical impact on the environment. As a result, no impact would occur.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

3.17 Transportation

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the Project:				
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	[ ]	[ ]	[X]	[ ]
b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	[ ]	[ ]	[X]	[ ]
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	[ ]	[ ]	[X]	[ ]
d) Result in inadequate emergency access?	[ ]	[ ]	[X]	[ ]

Discussion

The Project area's regional transportation network consists of State Route 74 (SR 74) and State Route 79 (SR). Interstate 215 (I-215) and Interstate 15 (I-15) are located west of Hemet, and State Route 60 (SR 60) and Interstate 10 (I-10) are located to the north. Regional truck routes follow SR 74, SR 79, and Domenigoni Parkway. Local access within the Project area is provided by Gibbel Road, Polly Butte Road, and Arvidson Road. In addition to these roadways, other connections to the region include the Burlington Northern Santa Fe Railway (BNSF Railway) line, which is a freight line used for goods transportation, the Riverside Transit Agency bus system, and bikeways. There are no existing or potential bus routes or commuter rail lines within the Project area.

The Riverside County Circulation Element (County of Riverside 2020) designates future road improvements and extensions, addresses non-motorized transportation alternatives, and identifies funding options. The Circulation Element also establishes standards for the movement of people, goods, and services throughout the planning area.

On September 3, 2020, the Southern California Association of Governments (SCAG) adopted Connect SoCal, SCAG's 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy. The plan is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. The plan details how the region will address its transportation and land use challenges and opportunities in order to achieve its regional emissions standards and GHG reduction targets. The Connect SoCal plan represents the vision for Southern California's future, including policies, strategies, and projects for advancing the region's mobility, economy, and sustainability through 2040 (SCAG 2020).

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

Construction of the proposed Project would have temporary impacts on local roadways including the Gibble Road and Polly Butte Road. Project construction is conservatively estimated to last 386 working days, beginning in approximately August 2024 and continuing until approximately February 2026 and is estimated to generate a maximum of approximately 40 one-way trips per day (consistent the CalEEMod model output). Construction activities would occur within the roadway rights of way and on the parcels selected for demolition, construction, and equipment staging activities.

A Riverside County community trail and combination trail (regional trail/Class I bike path) are located within the vicinity of the Project area. Access to these trails and bike path could be potentially impacted by construction within the roadway. Construction activities associated with demolition of the existing pump station and construction of the relocated pump station would occur entirely within the Project sites and would not impede traffic circulation. Pipeline construction within existing roadway rights-of-way may require lane closures. However, construction of the pipeline alignment would at a rate of approximately 50 linear feet per day, so impacts would not occur in the same area over the entire construction period, and disturbed areas would be restored to their original condition. Abandonment of the existing CML&C discharge line would have no impact. As a result, Project construction would not conflict with the Riverside County trails and bikeway system outlined in the Riverside County General Plan Circulation Element (County of Riverside 2020).

Operation of the proposed pipelines and Mission Canyon II Pump Station would not conflict with regional transportation plans or the Riverside County General Plan. The proposed pipelines would be below-ground pipelines and the O&M of the pump station would be incorporated into EMWD's existing O&M activities. The proposed Project's long-term impacts on the roadway or trails and bikeway system would therefore be less than significant.

Although construction impacts would be temporary and have limited footprints, construction of the proposed Project may require temporary closures of roadways. Potential impacts related to these closures would be minimized through the implementation of a Traffic Control and Detour Plan, as specified in *Section 2.6 EMWD Standard Construction Practices*, which would ensure that appropriate traffic controls are implemented to minimize impacts to the local roadways, bike lanes/trails during construction. With implementation of a Traffic Control and Detour Plan, the Project would not conflict with plans, ordinances or policies addressing the circulation system, and impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

CEQA Guidelines Section 15064.3, subdivision (b) outlines criteria for analyzing transportation impacts in terms of vehicle miles traveled (VMT) for land use projects and transportation projects. VMT refers to the amount and distance of automobile travel attributable to a project. According to the Office of Planning and Research *Technical Advisory on Evaluating Transportation Impacts in CEQA* (OPR 2018), the term "automobile" refers to on-road passenger vehicles, specifically cars and light-duty trucks. In the case of the proposed Project, worker trips would be conducted in cars and light-duty trucks. Vendor and hauling trips associated with construction of the proposed Project would be conducted in medium- or heavy-duty trucks and are therefore excluded from the estimation of VMT. Environmental impacts associated with the use of medium- and heavy-duty truck trips are addressed in the Air Quality, Energy, and Greenhouse Gas sections of this document.

Construction of the proposed Project would involve temporary worker trips which would occur during the 386 working day construction period, and require approximately 40 one-way trip worker trips per day (consistent with the CalEEMod model output). According to OPR *Technical Advisory on Evaluating Transportation Impacts in CEQA*, projects that generate fewer than 110 trips per day may be assumed to cause a less-than-significant transportation impact (OPR 2018). Therefore, construction of the Project would not result in a considerable increase in VMT.

Operation of the proposed Project is expected to require occasional worker trips for inspection and testing of the pipeline and pump station facility. However, these trips would be incorporated into EMWD's existing O&M activities and would not increase VMT in the Project area. Based on OPR guidance, the proposed Project would not create a significant impact related to VMT and the Project would be consistent with CEQA Guidelines Section 15064.3, subdivision (b). Impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

The Project would not construct new roadways or introduce vehicles that are incompatible with existing roads; existing roadways would be restored to their pre-existing condition once construction of the pipelines is completed. Driveways and the access road at replacement Mission Canyon II Pump Station would be designed according to EMWD standard specifications such that they would not impact circulation. Therefore, after construction, the Project would not create roadway hazards.

Project construction would require incompatible uses on roadways (i.e., use of heavy construction equipment), which could temporarily increase hazards in the Project area. The Traffic Control and Detour Plan (as specified in *Section 2.6 EMWD Standard Construction Practices*) would be required prior to the issuance of an encroachment permit from the County of Riverside and would include measures to ensure that vehicle ingress and egress from construction sites and the staging area(s) and use of heavy construction equipment in the Project area would occur safely. With implementation of the Traffic

Control and Detour Plan, impacts related to increase hazards from geometric design features or incompatible uses would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

d) Result in inadequate emergency access?

Construction of the proposed pipeline within existing roadway rights-of-way may require lane closures and would generate trips associated with construction (worker travel and delivery and hauling of materials and equipment). Lane closures have the potential to hinder access for emergency vehicles. In order to prevent Project construction from interfering with emergency responders, a Traffic Control and Detour Plan (as specified in *Section 2.6 EMWD Standard Construction Practices*). would be implemented. Traffic control measures implemented during Project construction would require that emergency crews be able to access sites and surrounding areas. The contractor would coordinate to ensure that emergency responders are informed of construction locations and would make a reasonable effort to preserve access to adjacent residences during construction. Thus, impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

3.18 Tribal Cultural Resources

	Potentially Significant Impact	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) 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	[ ]	[X]	[ ]	[ ]
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 Resources Code	[ ]	[X]	[ ]	[ ]

Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Discussion

A *Cultural Resources Technical Report* was prepared for the proposed Project in January 2024 by Rincon Consultants. The report includes a CHRIS cultural resources records search, a SLF search conducted by the NAHC, a review of historical aerial imagery and topographic maps, pedestrian surveys of the Project site, and geoarchaeological analysis. The report is provided in **Appendix D** and is relied upon for analysis in this MND.

Assembly Bill 52 Tribal Consultation

Assembly Bill (AB) 52 establishes a formal consultation process between the lead agency, EMWD, and all California Native American Tribes within the area regarding tribal cultural resource evaluation. AB 52 mandates that the lead agency must provide formal written notification to the designated contact of traditionally and culturally affiliated California Native American tribes that have previously requested notice. Native American tribes are notified early in the project review phase by written notification that includes a brief description of the proposed project, location, and the lead agency's contact information. The Tribal contact then has 30 days to request project-specific consultation pursuant to this section (Public Resources Code §21080.1).

As a part of the consultation pursuant Public Resources Code §21080.3.1(b), both parties may suggest mitigation measures (Public Resources Code §21082.3) that can avoid or substantially lessen potential significant impacts to tribal cultural resources or provide alternatives that would avoid significant impacts to a tribal cultural resource. The California Native American tribe may request consultation on mitigation measures, alternatives to the project, or significant effects. The consultation may also include discussion on the environmental review, the significance of tribal cultural resources, the significance of the project's impact on the tribal cultural resources, project alternatives, or the measures planned to preserve or mitigate. Consultation shall end when either: 1) both parties agree on the mitigation measures to avoid or mitigate significant effects on a tribal cultural resource, or 2) a party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached.

a.i) 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: 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).

As discussed in *Section 3.5 Cultural Resources*, a *Cultural Resources Technical Report* was prepared by Rincon in 2024 (**Appendix D**) and included a search of the CHRIS and SLF and other historical resources. The CHRIS records search and other background research identified 21 previously-recorded cultural resources within 1 mile of the Project area, none of which are located within the Project site boundaries. The SLF returned positive results and 20 prehistoric archaeological resources were identified within 1 mile of the Project area.

Although there are no known tribal cultural resources within the Project sites, the Project area is considered sensitive based on previous studies, the locations of known historic and prehistoric resources , and consultations with Native American tribes under AB 52 as discussed under *aii*, below.

However, although the historic resource could be considered eligible as a historical built environmental resource under CEQA, the field survey confirmed the resource is located outside of the Project site boundaries. No other historical built environment properties were identified during the field survey and review of historical aerial imagery and topographic maps. Therefore, the Project does not have the potential to impact historical built environment resources and there would be no impact to tribal cultural resources listed or eligible for listing as a historical resource, pursuant to CEQA.

The proposed Project would involve ground disturbing activities during construction and there is potential to encounter previously unknown tribal cultural resources. To reduce potential impacts, the Project would implement **Mitigation Measure TRI-1** which would require development of a tribal resource monitoring agreement to address monitoring and treatment of inadvertently discovered tribal cultural resources, **Mitigation Measure TRI-2** which would address procedures for tribal monitoring, **Mitigation Measure TRI-3** which would establish procedures for the disposition of inadvertent discoveries, and **Mitigation Measure TRI-4** which would ensure non-disclosure of any reburial locations. With the implementation of **Mitigation Measures TRI-1 through TRI-4**, impacts related to an adverse change in the significance of a tribal cultural resource listed or eligible for listing as a historic resource would be less than significant.

Mitigation Measures

TRI-1 Tribal Resources Monitoring Agreement. At least 30 days prior to the start of ground-disturbing activities, Eastern Municipal Water District (District) shall contact the Consulting Tribe(s) to develop Cultural Resources Treatment Monitoring Agreement (Agreement). The Agreement shall address the treatment of archaeological resources that may be Tribal cultural resources inadvertently discovered on the project site; project grading; ground disturbance and development scheduling; the designation, responsibilities, and participation of tribal monitor(s) during grading, excavation, and ground disturbing activities; and compensation for the tribal monitors, including overtime, weekend rates, and mileage reimbursement.

TRI-2 Tribal Monitoring. Prior to the start of ground-disturbing activities, a Tribal monitor may participate in the construction workers archaeological resources sensitivity training, conducted by the project archaeologist. At least seven business days prior to ground-disturbing activities, the District shall notify the Tribe of the grading/excavation schedule and coordinate the tribal monitoring schedule.

A Tribal monitor shall be present for ground-disturbing activities associated with the Project. Both the project archaeologist and Tribal monitor working together will determine the areas with a potential for encountering potential Tribal cultural resources. Both the archaeologist and tribal monitor shall have the authority to stop and redirect grading activities in order to evaluate the nature and significance of any archaeological resources discovered within the project limits. Such evaluation shall include culturally appropriate temporary and permanent treatment pursuant to the Cultural Resources Treatment and Monitoring Agreement, which may include avoidance of tribal cultural resources, in-place preservation, data recovery, and/or reburial so the resources are not subject to further disturbance in perpetuity. Any reburial shall occur at a location determined between the District and the consulting Tribe as described in **TRI-4**. Treatment may also include curation of the resources at a tribal curation facility or an archaeological curation facility, as determined in discussion among the District, the Tribe and the project archaeologist as addressed in the Cultural Resources Treatment and Monitoring Agreement. The on-site Tribal monitoring shall end when all ground disturbing activities on the project site are completed, or when the Tribal representatives and Tribal monitor have indicated that the project site has little or no potential for impacting Tribal Cultural Resources.

TRI-3 Disposition of Inadvertent Discoveries. In the event that Tribal Cultural Resources are recovered during the course of grading, the District shall relinquish ownership of all cultural resources, including sacred items, burial goods, archaeological artifacts, and non-human remains. The District will coordinate with the project archaeologist and the Tribe to conduct analysis of recovered resources. If it is determined that the resource is a Native American resource and thus significant under CEQA, avoidance of the resource will be explored as the preferred option and on-site reburial will be evaluated as the second option. If avoidance and on-site reburial are not possible, a treatment plan shall be prepared with State guidelines and in consultation with the Tribe. The treatment plan may include, but would not be limited to capping in place, excavation and removal of the resource, interpretive displays, sensitive area signage, or other mutually agreed upon measures. Treatment may also include curation of the cultural resources at a tribal curation facility, as determined by the District and the consulting Tribe.

TRI-4 Non-Disclosure of Reburial Locations. It is understood by all parties that unless otherwise required by law, the site of any reburial of culturally sensitive resources shall not be disclosed and shall not be governed by public disclosure requirements of the California Public Records Act. The coroner, pursuant to the specific exemption set forth in California Government Code 6254(r), parties, and Lead Agencies will be asked to withhold public disclosure information related to such reburial.

Significance Determination

Less than significant impact with mitigation incorporated.

a.ii) 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: 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 Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

As discussed in *Section 3.5 Cultural Resources*, a *Cultural Resources Technical Report* was prepared by Rincon in 2024 (**Appendix D**) and based on the results of the CHRIS and SLF searches the Project vicinity is sensitive for prehistoric tribal cultural resources.

The CHRIS records search and other background research identified 29 previous cultural resources studies within 1 mile of the Project site, two of which have footprints adjacent to the Project study area, but none are within the Project site boundaries, and 21 previously-recorded cultural resources within 1 mile of the Project area, none of which are located within the Project site boundaries. The SLF returned positive results and 20 prehistoric archaeological resources were identified within 1 mile of the Project area.

Although there are no known tribal cultural resources within the Project sites, the recorded boundaries of two prehistoric tribal cultural resources, are within close proximity of the Project site. Thus, the Project area is considered sensitive based on previous studies and the locations of known archaeological resources. The pedestrian survey conducted in September 2023 did not identify any artifacts or features within the Project site that may be associated with the recorded tribal cultural resources.

Per AB 52, EMWD initiated consultation with Native Tribes that are traditionally and culturally affiliated with the geographic area of the proposed Project to identify resources of cultural or spiritual value to the Tribe. On September 22, 2023, EMWD sent consultation notification letters to Native Tribes on EMWD's Master List pursuant to the requirements of AB 52 pertaining to government-to-government consultation. **Table 3-14** summarizes EMWD's consultation efforts. To date, EMWD has conducted consultation with three federally recognized Native Tribes: Agua Caliente Band of Cahuilla Indians, Pechanga Band of Indians, and Soboba Band of Luiseno Indians. An additional three Native Tribes were contacted but declined consultation or did not respond, as noted in **Table 3-14**.

Table 3-14: Tribal Consultation Summary

Tribe	Individual Contacted	Date Letter Mailed	Response Received	Consultation Held
Agua Caliente	Luz Salazar	09/22/2023	Accepted	12/19/2023
Morongo	Laura Chatterton	09/22/2023	Accepted	Did not respond
Pechanga	Ebru Ozdil	09/22/2023	Accepted	12/19/2023
Rincon	Cheryl Madrigal	09/22/2023	Declined	N/A
San Manuel	Alexandra McCleary	09/22/2023	Declined	N/A
Soboba	Joseph Ontiveros	09/22/2023	Accepted	01/03/2024

During the consultation meeting, the responding Tribes highlighted their concerns for the general area noting that within that it is within Traditional Use Areas and considered sensitive as there are existing sites in the surrounding areas. The Tribes provided recommendations with regards to mitigation. The Tribes expressed concern with potential unearthing of unknown artifacts while grading the selected site. The Tribes recommended tribal monitoring consistent with those measures used in prior CEQA analysis conducted by EMWD to mitigate the potential for uncovering of unknown buried artifacts

Although no tribal cultural resources have been identified within the Project site, the proposed Project would involve ground disturbing activities during construction and there is potential to encounter previously unknown tribal cultural resources. **Mitigation Measures TRI-1** through **TRI-4,** as noted in *a.i*) above, would be implemented to reduce potential impacts to tribal cultural resources during ground disturbing activities. Operation of the proposed Project would not involve ground disturbing activities and would therefore have no impact on tribal cultural resources. With implementation of mitigation measures potential impacts resulting in an adverse change to tribal cultural resources would be less than significant.

Mitigation Measures

Refer to **Mitigation Measures TRI-1** through **TRI-4** in *Section 3.18, a.i)* above.

Significance Determination

Less than significant impact with mitigation incorporated.

3.19 Utilities and Service Systems

Would the Project:	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*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 facilities, the construction or relocation of which could cause significant environmental effects?	[ ]	[ ]	[X]	[ ]
b) Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?	[ ]	[ ]	[ ]	[X]
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?	[ ]	[ ]	[ ]	[X]
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair	[ ]	[ ]	[X]	[ ]

the attainment of solid waste reduction goals?				
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	[ ]	[ ]	[X]	[ ]

<u>*Discussion*</u>

Water Service

EMWD provides potable water, agricultural water, and wastewater services for the proposed Project area. The majority of EMWD's supply is imported from MWD via the State Water Project and the Colorado River Aqueduct for potable and non-potable use and groundwater recharge. Groundwater is also pumped from the Hemet/San Jacinto and West San Jacinto areas of the San Jacinto Groundwater Basin to offset imported water supplies. Groundwater in portions of the West San Jacinto Basin is high in salinity and requires desalination treatment in one of two EMWD desalination plants before potable use (EMWD 2021).

Wastewater Treatment

EMWD provides wastewater collection and treatment in the proposed Project area. EMWD has four operational regional water reclamation facilities throughout its service area and interconnections between the local collection systems serving each treatment plant allow for operational flexibility and improved reliability. For wastewater treatment in the Project area, EMWD uses its Hemet/San Jacinto Regional Water Reclamation Facility (EMWD 2021).

Stormwater Drainage

Stormwater drainage infrastructure within the Project area consists of a network of natural and improved streams, storm channels, storm drains, and catch basins intended to manage stormwater that flows to tributary receiving waters and lakes of the San Jacinto River.

Electrical, Natural Gas, and Telecommunications Utilities

Southern California Gas Company, a division of Sempra Energy, supplies natural gas to businesses and residences in the Project area . Natural gas is provided through a network of gas transmission pipelines and distributed through existing mains. Electricity is provided by Southern California Edison Telecommunication services are provided by utilities that operate independently), which include but are not limited to AT&T, Spectrum, Frontier Communications, and T-Mobile.

Landfills

Solid waste generated by the Project would be disposed at the Lamb Canyon Sanitary Landfill, El Sobrante Landfill and/or, the Badlands Sanitary Landfill. The total remaining capacity at each of these landfills is shown in **Table 3-15.**

Table 3-14: Sanitary Landfill Maximum Permitted and Existing Capacity

Landfill	Maximum Permitted Capacity (Cubic Yards)	Remaining Capacity (Cubic Yards)	Ceased Operation Date
Lamb Canyon	39,681,513	19,242,950	4/1/2032
El Sobrante	6,003,343	3,271,203	11/1/2052
Badlands	82,300,000	7,800,000	1/1/2059

Sources
[1]CalRecycle n.d.a
[2]CalRecycle n.d.b
[3]CalRecycled n.d.c.

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

The proposed Project would demolish and replace the existing pump station, construct pipelines, and abandon existing pipelines. Drainage at the Mission Canyon II Pump Station site would include features to prevent flooding on site and prevent erosion of soil. Storm water drainage to serve the pump station site would be designed in accordance with RCFC's flood control and water quality requirements and would not limited require improvements to the existing municipal storm water drain system. As discussed in *Section 3.14 Population and Housing*, the proposed Project would serve existing and planned communities and would not induce unplanned population or employment growth that would require or result in the construction of new or expanded water, wastewater treatment, stormwater drainage, electrical power, natural gas, or telecommunications facilities or additional water infrastructure in addition to the proposed Project. As discussed in Section *2 Project Description,* electrical generator buildings would be constructed to provide energy from the replacement pump station. However, as explained in *Section 3.6 Energy,* energy consumption of the proposed Mission Canyon II Pump Station would be the same as the existing pump station, and proposed Project pipelines would not be associated with long-term energy usage because O&M activities would be incorporated into EMWD's existing O&M activities. The Project would not result in the need to construct new electrical facilities other than those required to serve the replacement Mission Canyon II Pump Station. The environmental impacts of construction and operation of the proposed Project components are evaluated throughout this IS/MND and are mitigated to less than significant levels.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

The Project proposes to replace and demolish the existing Mission Canyon II Pump Station facility, construct new pipelines, and abandon existing pipelines to improve water supply reliability to unincorporated areas in Riverside County. Construction of the proposed Project would require a minimal water supply for dust control and concrete mixing during construction. Existing sources would be sufficient, and no new or expanded supply would be required for construction. Operation of the proposed Project would not induce unplanned population growth that would require the construction of new water treatment facilities or the expansion of existing facilities. The supply would accommodate existing water demand and is consistent with planned growth anticipated in the 2020 UWMP. No impact related to sufficient water supplies would occur.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

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?

As discussed under *Impact b)* above and in *Section 3.14 Population and Housing,* the proposed Project would serve existing and planned development that would occur with or without the proposed Project and would not induce unplanned population or employment growth that would require or result in the construction of new or expanded wastewater collection infrastructure or treatment services. Therefore, there would be no impact.

Mitigation Measures

None required or recommended.

Significance Determination

No impact.

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?

Construction of the proposed Project would generate soil and asphalt waste during installation of underground pipelines and abandonment of existing pipelines. While excavated soil would be reused onsite as backfill to the extent feasible, it is estimated that approximately 10 percent or less of the excavated material would need be exported and disposed at a permitted landfill in accordance with local and state solid waste disposal requirements. There are two state regulations that set standards for solid waste generation: AB 939 mandates 50 percent diversion of solid waste; and AB 341 mandates recycling programs to help reduce GHG emissions. Waste material may be hauled to the Lamb Canyon Landfill (16411 Lamb Canyon Road), which is approximately 12.5 miles east of the Project area. The Lamb Canyon Landfill has a remaining capacity of 19,242,950 cy with a maximum capacity of 39,681,513 cy (CalRecycle n.d.). Therefore, the existing landfill would have a total permitted area to accommodate construction debris from the proposed Project. Excess construction debris is anticipated to be within the permitted capacity of the local landfill after onsite backfill of excavated soil combined with adherence to mandatory construction waste diversion requirements.

Operation of the proposed Project is not anticipated to generate solid waste in the long-term. Therefore, solid waste generation would be limited to temporary construction activities and would not affect available solid waste disposal capacity in the region. Therefore, impacts related to local infrastructure capacity would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

Construction and operation of the proposed Project would comply with local, state, and federal regulations related to solid waste. While operation of the proposed Project is not anticipated to generate long-term solid waste, construction activities would create debris such as excavated soil and asphalt. Excavated soil would be backfilled to the extent possible, but construction contractor(s) would be required to dispose of excess construction debris in accordance with existing reduction statutes (AB 939 and AB 341) and regulations. These regulations would determine the landfill to be used for disposal of construction debris, mandatory 50 percent diversion of solid waste (AB 939), and mandatory recycling programs to reduce GHG emissions (AB 341). Therefore, impacts related to compliance with local, state, and federal reduction statues and regulations related to solid waste would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

3.20 Wildfire

	Potentially Significant Impact	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	[ ]	[ ]	[X]	[ ]

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?	[ ]	[ ]	[X]	[ ]
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	[ ]	[ ]	[X]	[ ]
d) Expose people or structures to significant risks, including downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	[ ]	[ ]	[X]	[ ]

Discussion

The California Public Resources Code 4201-4204 directs CAL FIRE to map fire hazard within state responsibility areas based on fuel loading, slope, fire weather, and other relevant factors present, including areas where winds have been identified by the department as a major cause of wildfire spread. As shown in **Figure 3-7**, the proposed Project area is designated as a very high fire hazard severity zone (VHFHSZ) within the 2007 Riverside West SRA map (CAL FIRE 2007). The updated 2023 Riverside SRA map also designated the Project area as a VHFHSZ; however, these maps are currently in the regulatory process and not final (CAL FIRE 2023).

The Riverside County Land Use Element (County of Riverside 2021) identifies the natural and human-caused hazards that affect existing and future development and provide guidelines for protecting residents, employees, visitors, and other community members from injury and death. The County of Riverside Emergency Operations Plan (EOP) (County of Riverside 2019b) serves as the foundation for response and recovery operations for the County of Riverside, as it establishes roles and responsibilities, assigns tasks, and specifies policies and general procedures.

The County of Riverside Operational Area Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) (County of Riverside 2023c) aims to reduce the impact of a disaster by identifying hazards and developing ways to decrease their impact. The purpose of the LHMP is to identify the County's hazards, review and assess past disaster occurrences, estimate the probability of future occurrences, and set goals to mitigate potential risks to reduce or eliminate long-term risk to people and property from natural and human-caused hazards.

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

Project construction activities would be located within easements, public rights-of-way, and EMWD-owned land. Potential staging areas include portions of the relocated Mission Canyon II Pump Station site, and a turnout of the dirt road near the intersection of Gibbel Road and Polly Butte Road. Temporary lane closures during construction may restrict access for use by vehicles during an emergency response or evacuation and could impair implementation of or physically interfere with the City's adopted EOP or Riverside County LHMP. EMWD would develop a Traffic Control and Detour Plan (see *Section 2.6 EMWD Standard Construction Practices*) which would reduce conflict between temporary construction activities and the EOP and LHMP by requiring coordination with emergency services (police, fire, and others); requiring identification of roadways and access points for emergency services; and requiring that disruptions to or closures of these locations be minimized. Impacts of construction on the adopted EOP and Riverside County LHMP would be less than significant. Further consideration of the proposed construction activities and potential for roadway access and hazardous conditions can be found under *Section 3.17 Transportation*.

Upon completion of pipeline installation, all roadway rights-of-way would be restored to pre-construction conditions, and the operation and maintenance of the replacement pump station would be incorporated into EMWD's existing O&M activities. Therefore, operation of the proposed Project would not physically impair or otherwise interfere with adopted emergency response or evacuation plans in the Project area. Impacts would be less than significant.

<u>Mitigation Measures</u>

None required or recommended.

Significance Determination

Less than significant impact.

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?

The proposed Project area is located within a designated VHFHSZ within the Riverside West SRA. Staging areas would be located within portions of the vacant Mission Canyon II Pump Station site and a dirt turnout near the intersection of Gibbel Road and Polly Butte Road. Pipelines would be installed below ground in existing public roads, and the Mission Canyon II Pump Station would be constructed on an existing flat vacant parcel adjacent to a local natural drainage on the north and Gibble Road on the south. Pump station equipment would be housed within concrete buildings, minimizing risk of fire hazards. The use of construction equipment that could potentially spark or otherwise ignite a fire during normal construction activities, does however, pose a risk of fire in a high or very high fire hazard severity zone. The implementation of EMWD's standard fire hazard reduction measures as specified in *Section 2.6 EMWD Standard Construction Practices*, and equipping construction equipment with spark arrestors, per industry standards would ensure the Project would not exacerbate wildfire risks and thereby expose people in the Project area to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. Impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

The proposed Project would not involve the installation or maintenance of infrastructure that is typically associated with fire risk, such as roads, fuel breaks, emergency water sources, or power lines. Construction and operation of the proposed Project would rely on existing roads and utilities. Installation of the pipelines would occur within existing roadway rights of way, and construction of the replacement Mission Canyon II Pump

Station would occur within vacant EMWD-owned land. Pump station equipment would be housed in concrete buildings at the relocated Mission Canyon II Pump, and a buffer would be maintained around the site, clear of weedy vegetation, to reduce potential wildfire fuel. Therefore, once construction is complete, the Project would not exacerbate fire risk. Impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

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

The proposed Project would be located within existing roadway rights-of-way and vacant EMWD-owned land. Pipelines would be installed below-grade and overlying ground surface will be restored to pre-construction conditions, resulting in no permanent impact on site drainage. While construction of the pump station would occur within a graded construction pad that would be approximately 6 to 8 feet higher that the adjacent ground surface, design of the site would direct storm water runoff to discharge to a gravel area for percolation, or into an adjacent natural drainage area in larger storms (see Section *2.4.1 Construction of Proposed Mission Canyon II Pump Station*). As a result, the proposed Project would not result in increased drainage or runoff that could contribute to post-fire slope instability, landslides, or flooding. The proposed Project would have a less than significant impact related to increasing impervious surfaces and stormwater runoff (see *Section 3.10 Hydrology and Water Quality*).

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

3.21 Mandatory Findings of Significance

Does the Project:	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
a) Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	[ ]	[X]	[ ]	[ ]
b) 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)?	[ ]	[ ]	[X]	[ ]
c) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	[ ]	[X]	[ ]	[ ]

Discussion

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

With the implementation of mitigation measures, the proposed Project would have a less than significant impact on the environment. Based on the results of the BRA, one special-status plant species is present and 13 special-status plant species have some potential to occur in the Project area. Furthermore, multiple bird species protected by the Migratory Bird Treaty Act, and raptors protected under California Fish and Game Code Section 3503 have the potential to nest throughout the Study Area. To avoid and minimize the potential for impacts to sensitive plant species, **Mitigation Measure BIO-1** (Special Status and QCB Host Plant Surveys) would be implemented. Based on the results of the special-status plant surveys recommended in **Mitigation Measure BIO-1**, potential impacts to special-status plant species would be avoided or mitigated through the implementation of **Mitigation Measures BIO-2** (Worker Environmental Awareness Training), **BIO-3** (Invasive Plant Species Control), **BIO-4** (Biological Monitoring), and **BIO-5** (General Best Management Practices) or found to be less than significant without the need for additional mitigation. To avoid and minimize the potential for impacts to sensitive wildlife species, **Mitigation Measures BIO-1**, **BIO-2**, **BIO-3**, **BIO-4**, **BIO-5, BIO-6** (Focused Crotch Bumble Bee Surveys), **BIO-7** (Focused QCB Surveys), and **BIO-8** (Coastal California Gnatcatcher Avoidance and Minimization) would be implemented. To avoid direct or indirect impacts to nesting birds, **Mitigation Measure BIO-9** (Pre-construction Nesting Bird Surveys) would be implemented.

Although there are no known archaeological or historical resources within the Project sites, the Project area is considered sensitive based on previous studies and the locations of known archaeological deposits, and ground disturbing activities during construction have the potential to encounter previously unknown archaeological resources. Implementation of **Mitigation Measure CUL-1** would require development of a cultural resource monitoring plan, **CUL-2** would require the evaluation and inventory of any discovered artifacts, **CUL-3** would require the establishment of a buffer surrounding the boundary of a known cultural resource, and **CUL-4** would establish procedures for discovery of human remains. Additionally, **Mitigation Measure TRI-1** would require development of a tribal resource monitoring agreement, **TRI-2** would address procedures for tribal monitoring, **TRI-3** would establish procedures for the disposition of inadvertent discoveries, and **TRI-4** would ensure non-disclosure of any reburial locations. Although there are no known fossils uncovered within the Project area, the Project area is underlain by geologic units with "High A" paleontological sensitivity. Implementation of **Mitigation Measure GEO-1** would require a Paleontological Worker Environmental Awareness Program training be conducted prior to the start of construction at Component 6. To ensure proper procedures are in place in the event of an unanticipated fossil discovery, **Mitigation Measure GEO-2** would be implemented during construction of the Project.

With implementation of the aforementioned mitigation measures, the proposed Project would not have the potential to substantially degrade the quality of the environment, substantially reduce habitat or threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.

Mitigation Measures

Refer to **Mitigation Measures BIO-1** through **BIO-9** in *Section 3.4 Biological Resources*.

Refer to **Mitigation Measures CUL-1** through **CUL-4** in *Section 3.5 Cultural Resources*.

Refer to **Mitigation Measures TRI-1** through **TRI-4** in *Section 3.18 Tribal Cultural Resources*.

Refer to **Mitigation Measures GEO-1** and **GEO-2** in *Section 3.7 Geology and Soils*.

Significance Determination

Less than significant impact with mitigation incorporated.

b) 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)?

CEQA Guidelines Section 15130(b) provides two approaches to discussing cumulative project impacts: either the List-of-Projects Method: a list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or the Summary-of-Projections Method: a summary of projections contained in an adopted general plan or related planning document or in a prior environmental document that has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency. EMWD is relying on the List-of-Projects method for purposes of this analysis.

The proposed Project was included in EMWD's 2016 Master Plan along with other improvements in the Mission Canyon II 2264 Pressure Zone to address existing and future hydraulic deficiencies. No additional EMWD projects are proposed in the Project vicinity that, together with the proposed Project, would result in cumulative impacts.

As specified throughout this Initial Study, the proposed Project is consistent with applicable local, regional and state plans, would comply with applicable local, state and federal regulations, and would implement EMWD standard construction practices. The Project does not result in significant unavoidable impacts. The Project is not considered growth-inducing as defined by State CEQA Guidelines Section 15126.2(d), and would not induce, either directly or indirectly, population and/or housing growth. The Project would not result in any impacts that would be individually limited, but cumulatively considerable. Therefore, impacts would be less than significant.

Mitigation Measures

None required or recommended.

Significance Determination

Less than significant impact.

c) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

With the implementation of mitigation measures, the proposed Project would have a less than significant environmental impact on human beings. Although standard construction measures would be implemented during construction of the proposed Project (see *Section 2.6 EMWD Standard Construction Practices*), temporary construction activities would still have the potential to exceed noise thresholds. EMWD would require the Project contractor to implement **Mitigation Measure NOI-1**, which includes a number of BMPs to control and reduce temporary construction noise. With the implementation of these actions, the proposed Project would have a less than significant impact on human beings as a result of noise. The impacts of the proposed Project have been analyzed in accordance with the CEQA Guidelines; each topic has been found to have either no impact, a less than significant impact, or a less than significant impact with mitigation incorporated. Therefore, with the implementation of the **Mitigation Measure NOI-1**, the proposed

Project would not result in any environmental effects that would cause substantial adverse effects on human beings either directly or indirectly.

Mitigation Measures

Refer to **Mitigation Measure NOI-1** in *Section 3.13 Noise*.

Significance Determination

Less than significant impact with mitigation incorporated.

4. REPORT PREPARATION

4.1 Report Authors

This report was prepared by EMWD, Woodard & Curran, and teaming partners. Staff from these agencies and companies that were involved include:

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APPENDIX A

CALEEMOD AIR QUALITY DATA SHEETS

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Mission Canyon II Pump Station and Pipeline Project Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Mission Canyon II Pump Station and Pipeline Project
Construction Start Date	1/1/2025
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	8.60
Location	33.70145449552295, -116.94208013716688
County	Riverside-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5687
EDFZ	11
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.21

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Other Asphalt Surfaces	17.2	1000sqft	0.39	0.00	0.00	0.00	—	Pipeline (Asphalt)

Other Non-Asphalt Surfaces	61.7	1000sqft	1.42	0.00	0.00	0.00	—	Pipeline (Dirt)
General Light Industry	12.7	1000sqft	0.29	12,685	0.00	0.00	—	Replacement Pump Station and Demolition of Existing Pump Station

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.36	5.34	39.1	48.5	0.11	1.52	0.98	2.10	1.40	0.25	1.50	—	11,337	11,337	0.46	0.36	5.73	11,384
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.90	5.82	47.5	57.3	0.11	1.91	0.98	2.53	1.76	0.25	1.90	—	11,814	11,814	0.49	0.36	0.15	11,861
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.03	2.09	13.2	16.1	0.03	0.51	0.23	0.73	0.47	0.05	0.52	—	3,847	3,847	0.15	0.07	0.48	3,871
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.37	0.38	2.40	2.94	0.01	0.09	0.04	0.13	0.09	0.01	0.10	—	637	637	0.03	0.01	0.08	641

Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	75.0	100	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	—	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	75.0	100	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	—	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	6.36	5.34	39.1	48.5	0.11	1.52	0.98	2.10	1.40	0.25	1.50	—	11,337	11,337	0.46	0.36	5.73	11,384
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	6.90	5.82	47.5	57.3	0.11	1.91	0.98	2.53	1.76	0.25	1.90	—	11,814	11,814	0.49	0.36	0.15	11,861
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	2.03	2.09	13.2	16.1	0.03	0.51	0.23	0.73	0.47	0.05	0.52	—	3,847	3,847	0.15	0.07	0.48	3,871
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.37	0.38	2.40	2.94	0.01	0.09	0.04	0.13	0.09	0.01	0.10	—	637	637	0.03	0.01	0.08	641

3. Construction Emissions Details

3.1. Component 2 - Demolition (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.75	1.47	13.9	15.1	0.02	0.57	—	0.57	0.52	—	0.52	—	2,494	2,494	0.10	0.02	—	2,502
Demolition	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.19	0.16	1.53	1.65	< 0.005	0.06	—	0.06	0.06	—	0.06	—	273	273	0.01	< 0.005	—	274
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.28	0.30	< 0.005	0.01	—	0.01	0.01	—	0.01	—	45.2	45.2	< 0.005	< 0.005	—	45.4
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—

Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.04	0.54	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	112	112	0.01	< 0.005	0.01	114
Vendor	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	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	8.62	8.62	< 0.005	< 0.005	< 0.005	9.03
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.5	12.5	< 0.005	< 0.005	0.02	12.7
Vendor	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	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.94	0.94	< 0.005	< 0.005	< 0.005	0.99
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.07	2.07	< 0.005	< 0.005	< 0.005	2.10
Vendor	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	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.16	0.16	< 0.005	< 0.005	< 0.005	0.16

3.3. Component 1 - Site Preparation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.42	1.19	10.9	11.0	0.03	0.47	—	0.47	0.43	—	0.43	—	2,717	2,717	0.11	0.02	—	2,726
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	0.13	1.22	1.23	< 0.005	0.05	—	0.05	0.05	—	0.05	—	305	305	0.01	< 0.005	—	306
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.22	0.22	< 0.005	0.01	—	0.01	0.01	—	0.01	—	50.5	50.5	< 0.005	< 0.005	—	50.7
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.32	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	67.5	67.5	< 0.005	< 0.005	0.01	68.4
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.68	7.68	< 0.005	< 0.005	0.01	7.79
Vendor	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	0.00
Hauling	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	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.27	1.27	< 0.005	< 0.005	< 0.005	1.29
Vendor	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	0.00
Hauling	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	0.00

3.5. Component 1 - Grading (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.48	1.24	8.70	10.5	0.03	0.31	—	0.31	0.29	—	0.29	—	3,375	3,375	0.14	0.03	—	3,387
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.48	1.24	8.70	10.5	0.03	0.31	—	0.31	0.29	—	0.29	—	3,375	3,375	0.14	0.03	—	3,387
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.16	0.14	0.95	1.15	< 0.005	0.03	—	0.03	0.03	—	0.03	—	370	370	0.02	< 0.005	—	371
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.17	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	—	61.2	61.2	< 0.005	< 0.005	—	61.5
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.05	0.84	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	147	147	0.01	0.01	0.54	149
Vendor	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	0.00
Hauling	0.07	0.03	1.91	0.47	0.01	0.03	0.45	0.49	0.03	0.13	0.16	—	1,723	1,723	0.03	0.27	3.67	1,808
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.05	0.65	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	135	135	0.01	0.01	0.01	137
Vendor	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	0.00
Hauling	0.07	0.03	2.00	0.47	0.01	0.03	0.45	0.49	0.03	0.13	0.16	—	1,724	1,724	0.03	0.27	0.10	1,805
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	15.0	15.0	< 0.005	< 0.005	0.03	15.2

Vendor	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	0.00
Hauling	0.01	< 0.005	0.22	0.05	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	189	189	< 0.005	0.03	0.17	198
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.48	2.48	< 0.005	< 0.005	< 0.005	2.52
Vendor	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	0.00
Hauling	< 0.005	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	31.3	31.3	< 0.005	< 0.005	0.03	32.8

3.7. Component 3, 4, 6, 7 - Demolition and Open Trenching (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.80	1.51	10.9	12.8	0.04	0.38	—	0.38	0.35	—	0.35	—	3,701	3,701	0.15	0.03	—	3,714
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.80	1.51	10.9	12.8	0.04	0.38	—	0.38	0.35	—	0.35	—	3,701	3,701	0.15	0.03	—	3,714
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.53	3.84	4.53	0.01	0.13	—	0.13	0.12	—	0.12	—	1,308	1,308	0.05	0.01	—	1,313
Onsite truck	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	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.70	0.83	< 0.005	0.02	—	0.02	0.02	—	0.02	—	217	217	0.01	< 0.005	—	217
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.08	0.06	1.12	0.00	0.00	0.18	0.18	0.00	0.04	0.04	—	196	196	0.01	0.01	0.71	199
Vendor	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	0.00
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.07	0.86	0.00	0.00	0.18	0.18	0.00	0.04	0.04	—	180	180	0.01	0.01	0.02	182
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.32	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	64.4	64.4	< 0.005	< 0.005	0.11	65.4
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.7	10.7	< 0.005	< 0.005	0.02	10.8
Vendor	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	0.00
Hauling	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	0.00

3.9. Component 1 - Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.95	2.47	18.8	21.3	0.05	0.74	—	0.74	0.68	—	0.68	—	5,418	5,418	0.22	0.04	—	5,436
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.32	0.27	2.06	2.34	0.01	0.08	—	0.08	0.07	—	0.07	—	594	594	0.02	< 0.005	—	596
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.38	0.43	< 0.005	0.01	—	0.01	0.01	—	0.01	—	98.3	98.3	< 0.005	< 0.005	—	98.6
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.02	0.02	0.30	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	52.1	52.1	< 0.005	< 0.005	0.19	53.0
Vendor	< 0.005	< 0.005	0.06	0.02	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	< 0.005	—	52.3	52.3	< 0.005	0.01	0.15	54.9
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.32	5.32	< 0.005	< 0.005	0.01	5.40
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.74	5.74	< 0.005	< 0.005	0.01	6.01
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.88	0.88	< 0.005	< 0.005	< 0.005	0.89
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.95	0.95	< 0.005	< 0.005	< 0.005	0.99
Hauling	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	0.00

3.11. Component 3, 4 - Paved Surface Restoration (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.37	1.15	9.23	11.6	0.02	0.40	—	0.40	0.37	—	0.37	—	1,697	1,697	0.07	0.01	—	1,703
Paving	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.37	1.15	9.23	11.6	0.02	0.40	—	0.40	0.37	—	0.37	—	1,697	1,697	0.07	0.01	—	1,703
Paving	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.32	0.27	2.17	2.74	< 0.005	0.09	—	0.09	0.09	—	0.09	—	400	400	0.02	< 0.005	—	401
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.40	0.50	< 0.005	0.02	—	0.02	0.02	—	0.02	—	66.2	66.2	< 0.005	< 0.005	—	66.4
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.07	1.25	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	220	220	0.01	0.01	0.80	224
Vendor	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	0.00
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	0.08	0.97	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	202	202	0.01	0.01	0.02	205
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.24	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	48.3	48.3	< 0.005	< 0.005	0.08	49.0
Vendor	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	0.00
Hauling	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	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.00	8.00	< 0.005	< 0.005	0.01	8.12
Vendor	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	0.00
Hauling	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	0.00

3.13. Component 1 - Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.83	0.70	6.13	8.21	0.01	0.27	—	0.27	0.25	—	0.25	—	1,244	1,244	0.05	0.01	—	1,248
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.08	0.72	0.97	< 0.005	0.03	—	0.03	0.03	—	0.03	—	147	147	0.01	< 0.005	—	147
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.13	0.18	< 0.005	0.01	—	0.01	0.01	—	0.01	—	24.3	24.3	< 0.005	< 0.005	—	24.3
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.05	0.84	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	147	147	0.01	0.01	0.54	149
Vendor	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	0.00
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	16.1	16.1	< 0.005	< 0.005	0.03	16.3
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.67	2.67	< 0.005	< 0.005	< 0.005	2.71
Vendor	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	0.00
Hauling	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	0.00

3.15. Components 6, 7 - Dirt Surface Restoration (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.26	0.22	2.35	3.84	0.01	0.09	—	0.09	0.09	—	0.09	—	589	589	0.02	< 0.005	—	591

Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.26	0.42	< 0.005	0.01	—	0.01	0.01	—	0.01	—	64.5	64.5	< 0.005	< 0.005	—	64.7
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	< 0.005	0.05	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.7	10.7	< 0.005	< 0.005	—	10.7
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.22	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	45.0	45.0	< 0.005	< 0.005	< 0.005	45.6
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.99	4.99	< 0.005	< 0.005	0.01	5.07
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.83	0.83	< 0.005	< 0.005	< 0.005	0.84
Vendor	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	0.00
Hauling	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	0.00

3.17. Component 1 - Architectural Coating (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	3.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	3.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.01	0.10	0.12	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	14.6	14.6	< 0.005	< 0.005	—	14.7
Architectural Coatings	—	0.38	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.42	2.42	< 0.005	< 0.005	—	2.43
Architectural Coatings	—	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.4	10.4	< 0.005	< 0.005	0.04	10.6
Vendor	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	0.00
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.59	9.59	< 0.005	< 0.005	< 0.005	9.72
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.06	1.06	< 0.005	< 0.005	< 0.005	1.08
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.18	0.18	< 0.005	< 0.005	< 0.005	0.18
Vendor	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	0.00
Hauling	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	0.00

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Component 2 - Demolition	Demolition	1/1/2025	2/25/2025	5.00	40.0	Existing PS - Demolition
Component 1 - Site Preparation	Site Preparation	1/1/2025	2/26/2025	5.00	41.0	Replacement PS - Site Prep
Component 1 - Grading	Grading	2/27/2025	4/23/2025	5.00	40.0	Replacement PS - Rough grading
Component 3, 4, 6, 7 - Demolition and Open Trenching	Grading	1/1/2025	6/30/2025	5.00	129	All Pipelines - Open Trenching
Component 1 - Building Construction	Building Construction	4/24/2025	6/18/2025	5.00	40.0	Replacement PS - Site Improvements
Component 3, 4 - Paved Surface Restoration	Paving	1/1/2025	4/30/2025	5.00	86.0	Paved Pipelines - Surface Restoration
Component 1 - Paving	Paving	7/1/2025	8/18/2025	5.00	43.0	Replacement PS - Surface Restoration
Components 6, 7 - Dirt Surface Restoration	Paving	1/1/2025	2/25/2025	5.00	40.0	Unpaved Pipelines - Surface Restoration

Component 1 - Architectural Coating	Architectural Coating	8/19/2025	10/13/2025	5.00	40.0	Replacement PS - Architectural Coating

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Component 2 - Demolition	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Component 2 - Demolition	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Component 2 - Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Component 1 - Site Preparation	Graders	Diesel	Average	1.00	8.00	148	0.41
Component 1 - Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	1.00	7.00	84.0	0.37
Component 1 - Site Preparation	Scrapers	Diesel	Average	1.00	8.00	423	0.48
Component 1 - Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	7.00	84.0	0.37
Component 1 - Grading	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Component 1 - Grading	Off-Highway Trucks	Diesel	Average	2.00	8.00	376	0.38
Component 1 - Grading	Dumpers/Tenders	Diesel	Average	1.00	8.00	16.0	0.38
Component 3, 4, 6, 7 - Demolition and Open Trenching	Tractors/Loaders/Backhoes	Diesel	Average	2.00	7.00	84.0	0.37
Component 3, 4, 6, 7 - Demolition and Open Trenching	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Component 3, 4, 6, 7 - Demolition and Open Trenching	Off-Highway Trucks	Diesel	Average	2.00	8.00	376	0.38

Component 3, 4, 6, 7 - Demolition and Open Trenching	Pumps	Diesel	Average	1.00	8.00	11.0	0.74
Component 3, 4, 6, 7 - Demolition and Open Trenching	Dumpers/Tenders	Diesel	Average	1.00	8.00	16.0	0.38
Component 3, 4, 6, 7 - Demolition and Open Trenching	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Component 1 - Building Construction	Cranes	Diesel	Average	1.00	8.00	367	0.29
Component 1 - Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Component 1 - Building Construction	Off-Highway Trucks	Diesel	Average	2.00	8.00	376	0.38
Component 1 - Building Construction	Cement and Mortar Mixers	Diesel	Average	1.00	8.00	10.0	0.56
Component 1 - Building Construction	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Component 1 - Building Construction	Rollers	Diesel	Average	1.00	8.00	36.0	0.38
Component 1 - Building Construction	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Component 1 - Building Construction	Air Compressors	Diesel	Average	1.00	8.00	37.0	0.48
Component 1 - Building Construction	Sweepers/Scrubbers	Diesel	Average	1.00	8.00	36.0	0.46
Component 1 - Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Component 1 - Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Component 3, 4 - Paved Surface Restoration	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Component 3, 4 - Paved Surface Restoration	Cement and Mortar Mixers	Diesel	Average	1.00	8.00	10.0	0.56

Component 3, 4 - Paved Surface Restoration	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Component 3, 4 - Paved Surface Restoration	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Component 3, 4 - Paved Surface Restoration	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Component 3, 4 - Paved Surface Restoration	Air Compressors	Diesel	Average	1.00	8.00	37.0	0.48
Component 3, 4 - Paved Surface Restoration	Sweepers/Scrubbers	Diesel	Average	1.00	8.00	36.0	0.46
Component 3, 4 - Paved Surface Restoration	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Component 1 - Paving	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Component 1 - Paving	Cement and Mortar Mixers	Diesel	Average	1.00	8.00	10.0	0.56
Component 1 - Paving	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Component 1 - Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Component 1 - Paving	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Components 6, 7 - Dirt Surface Restoration	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Components 6, 7 - Dirt Surface Restoration	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Component 1 - Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Component 1 - Grading	—	—	—	—

Component 1 - Grading	Worker	15.0	12.8	LDA,LDT1,LDT2
Component 1 - Grading	Vendor	—	8.33	HHDT,MHDT
Component 1 - Grading	Hauling	25.0	20.0	HHDT
Component 1 - Grading	Onsite truck	—	—	HHDT
Component 3, 4, 6, 7 - Demolition and Open Trenching	—	—	—	—
Component 3, 4, 6, 7 - Demolition and Open Trenching	Worker	20.0	12.8	LDA,LDT1,LDT2
Component 3, 4, 6, 7 - Demolition and Open Trenching	Vendor	—	8.33	HHDT,MHDT
Component 3, 4, 6, 7 - Demolition and Open Trenching	Hauling	0.00	20.0	HHDT
Component 3, 4, 6, 7 - Demolition and Open Trenching	Onsite truck	—	—	HHDT
Component 1 - Building Construction	—	—	—	—
Component 1 - Building Construction	Worker	5.33	12.8	LDA,LDT1,LDT2
Component 1 - Building Construction	Vendor	2.08	8.33	HHDT,MHDT
Component 1 - Building Construction	Hauling	0.00	20.0	HHDT
Component 1 - Building Construction	Onsite truck	—	—	HHDT
Component 3, 4 - Paved Surface Restoration	—	—	—	—
Component 3, 4 - Paved Surface Restoration	Worker	22.5	12.8	LDA,LDT1,LDT2
Component 3, 4 - Paved Surface Restoration	Vendor	—	8.33	HHDT,MHDT
Component 3, 4 - Paved Surface Restoration	Hauling	0.00	20.0	HHDT
Component 3, 4 - Paved Surface Restoration	Onsite truck	—	—	HHDT
Component 1 - Site Preparation	—	—	—	—
Component 1 - Site Preparation	Worker	7.50	12.8	LDA,LDT1,LDT2

Component 1 - Site Preparation	Vendor	—	8.33	HHDT,MHDT
Component 1 - Site Preparation	Hauling	0.00	20.0	HHDT
Component 1 - Site Preparation	Onsite truck	—	—	HHDT
Component 1 - Paving	—	—	—	—
Component 1 - Paving	Worker	15.0	12.8	LDA,LDT1,LDT2
Component 1 - Paving	Vendor	—	8.33	HHDT,MHDT
Component 1 - Paving	Hauling	0.00	20.0	HHDT
Component 1 - Paving	Onsite truck	—	—	HHDT
Component 1 - Architectural Coating	—	—	—	—
Component 1 - Architectural Coating	Worker	1.07	12.8	LDA,LDT1,LDT2
Component 1 - Architectural Coating	Vendor	—	8.33	HHDT,MHDT
Component 1 - Architectural Coating	Hauling	0.00	20.0	HHDT
Component 1 - Architectural Coating	Onsite truck	—	—	HHDT
Component 2 - Demolition	—	—	—	—
Component 2 - Demolition	Worker	12.5	12.8	LDA,LDT1,LDT2
Component 2 - Demolition	Vendor	—	8.33	HHDT,MHDT
Component 2 - Demolition	Hauling	0.13	20.0	HHDT
Component 2 - Demolition	Onsite truck	—	—	HHDT
Components 6, 7 - Dirt Surface Restoration	—	—	—	—
Components 6, 7 - Dirt Surface Restoration	Worker	5.00	12.8	LDA,LDT1,LDT2
Components 6, 7 - Dirt Surface Restoration	Vendor	—	8.33	HHDT,MHDT
Components 6, 7 - Dirt Surface Restoration	Hauling	0.00	20.0	HHDT
Components 6, 7 - Dirt Surface Restoration	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Apply dust suppressants to unpaved roads	84%	84%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%
Sweep paved roads once per month	9%	9%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Component 1 - Architectural Coating	0.00	0.00	19,028	6,343	4,731

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Component 2 - Demolition	0.00	0.00	0.00	400	—
Component 1 - Grading	8,000	0.00	0.00	0.00	—
Component 3, 4 - Paved Surface Restoration	0.00	0.00	0.00	0.00	1.81
Component 1 - Paving	0.00	0.00	0.00	0.00	1.81
Components 6, 7 - Dirt Surface Restoration	0.00	0.00	0.00	0.00	1.81

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%
Water Demolished Area	2	36%	36%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Other Asphalt Surfaces	0.39	100%
Other Non-Asphalt Surfaces	1.42	0%
General Light Industry	0.00	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2025	0.00	532	0.03	< 0.005

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	26.6	annual days of extreme heat
Extreme Precipitation	2.85	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	10.3	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A

Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	88.8
AQ-PM	14.8
AQ-DPM	14.5
Drinking Water	56.0
Lead Risk Housing	19.3
Pesticides	74.9
Toxic Releases	10.9
Traffic	3.58
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	0.00
Haz Waste Facilities/Generators	26.7
Impaired Water Bodies	0.00
Solid Waste	0.00
Sensitive Population	—
Asthma	74.6
Cardio-vascular	83.9
Low Birth Weights	66.1
Socioeconomic Factor Indicators	—
Education	26.4
Housing	11.2

Linguistic	16.4
Poverty	53.0
Unemployment	60.6

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	44.60413191
Employed	6.03105351
Median HI	36.9177467
Education	—
Bachelor's or higher	47.5426665
High school enrollment	100
Preschool enrollment	13.69177467
Transportation	—
Auto Access	67.17567047
Active commuting	3.567303991
Social	—
2-parent households	46.86256897
Voting	58.80918773
Neighborhood	—
Alcohol availability	93.54548954
Park access	8.032849994
Retail density	5.042987296
Supermarket access	24.08571795
Tree canopy	6.980623637

Housing	—
Homeownership	93.86629026
Housing habitability	64.90440139
Low-inc homeowner severe housing cost burden	32.06723983
Low-inc renter severe housing cost burden	19.68433209
Uncrowded housing	64.30129603
Health Outcomes	—
Insured adults	65.30219428
Arthritis	1.4
Asthma ER Admissions	34.0
High Blood Pressure	2.4
Cancer (excluding skin)	1.5
Asthma	43.1
Coronary Heart Disease	1.9
Chronic Obstructive Pulmonary Disease	7.7
Diagnosed Diabetes	26.4
Life Expectancy at Birth	35.2
Cognitively Disabled	14.5
Physically Disabled	24.6
Heart Attack ER Admissions	10.3
Mental Health Not Good	63.6
Chronic Kidney Disease	3.6
Obesity	44.4
Pedestrian Injuries	19.6
Physical Health Not Good	38.5
Stroke	7.6
Health Risk Behaviors	—

Binge Drinking	83.4
Current Smoker	61.3
No Leisure Time for Physical Activity	45.8
Climate Change Exposures	—
Wildfire Risk	36.9
SLR Inundation Area	0.0
Children	92.8
Elderly	6.5
English Speaking	69.4
Foreign-born	10.6
Outdoor Workers	59.6
Climate Change Adaptive Capacity	—
Impervious Surface Cover	90.9
Traffic Density	4.6
Traffic Access	23.0
Other Indices	—
Hardship	50.8
Other Decision Support	—
2016 Voting	70.9

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	31.0
Healthy Places Index Score for Project Location (b)	32.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Project Description
Construction: Off-Road Equipment	Project description
Construction: On-Road Fugitive Dust	67% of the pipeline construction would be within paved roads, 33% in unpaved roads
Operations: Energy Use	Pump station would replace existing pump station, so there would be no net increase in electrical use that would need to be calculated
Operations: Water and Waste Water	Pump station would not be associated with any water or wastewater use
Operations: Solid Waste	Pump station operation would not generate any solid waste
Operations: Refrigerants	Pump station operation would not include an refrigerants
Construction: Dust From Material Movement	Project Description

Woodard & Curran

APPENDIX B

BIOLOGICAL RESOURCES ASSESSMENT REPORT

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Mission Canyon II Pump Station and Pipeline Project

Biological Resources Assessment

prepared for

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prepared by

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San Diego, California 92123

March 2024

RINCON CONSULTANTS, INC. SINCE 1994

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1 Introduction

Woodard & Curran retained Rincon Consultants Inc. (Rincon) on behalf of the Eastern Municipal Water District (EMWD) to conduct a biological resources assessment for the Mission Canyon II Pump Station and Pipeline Project (project) located in Hemet, Riverside County, California. This report documents the results of the study and tasks conducted by Rincon; specifically, a review of aerial imagery, publicly-available literature, jurisdictional delineation, and field reconnaissance surveys. This study has been completed pursuant to the requirements of the California Environmental Quality Act (CEQA), with EMWD serving as the lead agency.

Project Location

The Project Area is located within unincorporated Riverside County, California (Attachment 1, Figure 1) primarily along Gibbel Road, east of State Street (Attachment 1, Figure 2), and within the City of Hemet sphere of influence. The Project Area is in the Hemet, California United States Geological Survey (USGS) 7.5-minute topographic quadrangle. The Public Land Survey System depicts the Project Area in Township 5 South, Range 1 West, Sections 25, 26, 35, and 36 of the San Bernardino Meridian (Earth Point 2023). The center point is located at 33°42'3.00"N, 116°56'33.84"W.

Project Description

The Project involves the construction and operation of a new pump station and associated pipelines to address hydraulic capacity issues of the existing Mission Canyon II Pump Station and the demolition of the existing Mission Canyon II Pump Station. Specifically, EMWD proposes the following seven Project components along with the use of two potential staging areas (i.e., Project Area):

- **Component 1:** Construct a new Mission Canyon II Pump Station facility along Gibbel Road;
- **Component 2:** Demolish the existing Mission Canyon II Pump Station located off Gibbel Road west of Crow Road;
- **Component 3:** Install approximately 3,200 linear feet (LF) of new 12-inch pipeline in Gibbel Road south of the new pump station;
- **Component 4:** Replace the existing 4-inch pipeline along Gibbel Road to the intersection of Polly Butte Road with approximately 1,100 LF of 8-inch pipeline;
- **Component 5:** Abandon approximately 3,050 LF of an existing 6-inch discharge pipeline from the existing Mission Canyon II Pump Station to the last service uphill of Polly Butte Road;
- **Component 6:** Install 1,050 LF of 2-inch service line from the existing 6-inch pipeline along Gibbel Road to 40751 Gibbel Road via slip-lining (no open cut trenching, but may require small excavation pits as needed for slip-lining through angled portions of the pipe); and
- **Component 7:** Replace the existing 6-inch pipeline along Polly Butte Road to the abandoned pipeline with approximately 1,100 LF of 8-inch pipeline.

The locations of the seven Project components and the two staging areas are depicted in Attachment 1, Figure 2.

2 Methodology

Regulatory Overview

Regulated resources studied and analyzed herein include special-status plant and animal species, nesting birds and raptors, sensitive plant communities, jurisdictional waters and wetlands, wildlife movement, and locally protected resources, such as protected trees. Regulatory authority over biological resources is shared by federal, state, and local authorities. Primary authority for regulation of general biological resources typically lies in the local land use control and planning authority, in this instance, the County of Riverside Planning Department.

Definition of Special-Status species

For the purposes of this project, special-status species include:

- Species listed as threatened or endangered under the federal Endangered Species Act (ESA);
- Species listed as candidate, threatened, endangered, or rare by the California Department of Fish and Wildlife (CDFW) under the California Endangered Species Act (CESA) or Native Plant Protection Act;
- Plant species occurring on lists 1 and 2 of the CDFW and California Native Plant Society (CNPS) California Rare Plant Rank (CRPR) system;
- Wildlife species designated as Fully Protected (FP) or Species of Special Concern (SSC) by the CDFW; and
- Species designated as sensitive or protected by the County and/or otherwise protected through ordinance or local policy.

Environmental Statues

For this report, potential impacts to biological resources were analyzed based on the following statutes:

- ESA
- Federal Clean Water Act (CWA)
- CESA
- CEQA
- California Fish and Game Code (CFGC)
- Migratory Bird Treaty Act (MBTA)
- Bald and Golden Eagle Protection Act
- Porter-Cologne Water Quality Control Act
- Riverside County Municipal Code

Guidelines for Determining CEQA Significance

The following threshold criteria, as defined by the CEQA Guidelines Appendix G Initial Study Checklist, were used to evaluate potential environmental effects. Based on these criteria, the proposed project would have a significant effect on biological resources if it would:

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

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

c) *Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marshes, vernal pools, coastal areas, 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.*

Literature Review

Prior to visiting the Study Area (Project Area plus a 100-foot buffer), Rincon reviewed Project plans, the pump station site's Biological Resources Constraints Analysis letter report (Rincon 2023), aerial imagery, publicly-available literature, and agency databases. These resources were reviewed to understand the context of the biological resources within the Study Area and to identify special-status species that have been previously documented in the region. The following resources were referenced to complete this task:

- Aerial imagery of the Study Area was reviewed in Google Earth (Google Earth Pro 2023).
- The California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Plants (CNPS 2023) was reviewed for records of special-status plant species within the *Hemet*, *California* USGS quadrangle, and the eight surrounding quadrangles (*Blackburn Canyon, Lake Fulmor, San Jacinto, Lake View, Winchester, Bachelor Mtn., Sage, and Cahuilla Mtn.*)
- The California Natural Diversity Database (CNDDB; CDFW 2023a) was queried for records of special-status species within the *Hemet, California* USGS and eight surrounding quadrangles
- The USFWS Information for Planning and Consultation (IPaC; USFWS 2023a) was searched for a list of federally threatened and endangered species with known or expected ranges overlapping or near the Study Area
- The USFWS Critical Habitat Portal (USFWS 2023b) was reviewed for information on federally designated critical habitat areas; and

- The information available in peer-reviewed journals and standard reference materials (Jameson and Peeters 2004; Calflora 2023; Holland 1986; Baldwin et al. 2012; Sawyer et al. 2009; Stebbins 2003; Sibley 2016).

To aid in characterizing the nature and extent of jurisdictional waters potentially occurring within the Study Area, the following additional resources were reviewed:

- The most recent *Hemet, California* USGS 7.5-minute topographic quadrangle map (USGS 2023)
- The U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA, NRCS 2023a)
- The USFWS National Wetlands Inventory (NWI; USFWS 2023c)
- The USGS National Hydrography Dataset (NHD; USGS 2023)
- The State Soils Data Access (SDA) Hydric Soils List (USDA, NRCS 2023b)

Field Reconnaissance Survey

A field reconnaissance survey was conducted on foot between 8:00 am to 4:00 pm on September 21, 2023, by Rincon Biologist's Casey Clark and Jorge Saavedra-Alvarado within the Components 1-4 and 6-7 Study Areas. Component 5 was neither surveyed nor assessed for biological resources since EMWD confirmed there will be no ground disturbance in association with the pipeline abandonment. The field survey was conducted to characterize the existing conditions within the Study Area and to the investigate the presence, or potential presence, of special-status plant and wildlife species, sensitive plant communities, jurisdictional waters and wetlands, wildlife migration and movement corridors, locally-protected resources, and nesting bird habitat (regulated biological resources). All biological resources observed were documented and the aquatic resources and vegetation communities/land cover types within the Study Area were photographed and recorded using a global positioning system (GPS) unit with submeter accuracy capabilities. Weather conditions during the survey included temperatures ranging between 60 to 75 degrees Fahrenheit, winds between 0 to 10 miles per hour, and overcast skies. Representative photographs of the site were taken and are included in Attachment 2 and a compendium of the plant and wildlife species observed within the Study Area is included in Attachment 3.

Jurisdictional Delineation Survey

A formal jurisdictional delineation was conducted within Component 1 of the Study Area by ELMT Consulting, Inc. in October of 2023 (ELMT Consulting, Inc. 2023). The results of ELMT's jurisdictional delineation are incorporated into this report. The potentially jurisdictional features within the remaining portions of the Study Area were mapped by Rincon during the field reconnaissance survey.

3 Existing Site Conditions

Climate, Topography, and Land Use

The weather in western Riverside County is typical of a Mediterranean climate. Summers are warm and dry, while winters are cool and wet with most of the precipitation falling between November and March. The Study Area is located within Avery Canyon in its northernmost extent and along the hillsides of Polly Butte in its southern extent. The Santa Rosa Hills bound the Study Area to the north. The portion of the Study Area within Avery Canyon is generally located on flat land or gentle slopes; the Study Area located along the slopes of Polly Butte generally contains moderate to steep slopes. Elevations within the Study Area range from 1,700 feet above mean sea level (amsl) in the western portion of the Component 2 Study Area, to 2,150 feet amsl in the southern portion of the Component 7 Study Area. The Project Area is located primarily within existing roads and vacant lots and the Study Area buffer contains undeveloped land with natural or semi-natural vegetation communities along with rural residential developments. The landscape surrounding the Study Area contains undeveloped semi-mountainous land with large granite boulders and natural or semi-natural vegetation communities. The Fairview Fire burned the majority of the Study Area and surrounding landscape in September 2022. Fire-impacted areas are in the early successional stage of recovery.

Soils

The USDA NRCS Web Soil Survey (USDA, NRCS 2023a) depicts seven soil map units[1] within the Study Area: Cieneba rocky sandy loam, 15 to 50 percent slopes, eroded (CkF2), Gorgonio loamy sand, 0 to 8 percent slopes (GhC); Gorgonio loamy sand, channeled, 2 to 15 percent slopes (GkD); Hanford coarse sandy loam, 2 to 8 percent slopes (HcC); Rockland (RtF); Vista coarse sandy loam, 15 to 35 percent slopes, eroded (VsF2); and Vista rocky coarse sandy loam, 2 to 35 percent slopes, eroded (VtF2). Soil map units are described below and depicted in Attachment 1, Figure 3.

Cieneba Rocky Sandy Loam, 15 to 50 Percent Slopes, Eroded (CkF2)

CkF2 is an excessively well drained soil that occurs along hills. It is a residuum soil that is weathered from igneous rock and a typical soil profile contains two distinct horizons. The first horizon occurs to a depth of 14 inches and contains sandy loam. The second horizon occurs to a depth of 22 inches and contains weathered bedrock. Available water storage is very low (about 1.4 inches), and the runoff class is medium. This soil is not prone to flooding or ponding and it is not considered hydric (USDA, NRCS 2023b). It covers approximately 75 percent of the Study Area where it is mapped along hillsides within portions of all Components and their associated Study Area buffers.

Gorgonio Loamy Sand, 0 to 8 Percent Slopes (GhC)

GhC is a somewhat excessively drained soil that is found in alluvial fans. It is an alluvium soil that is derived from granite and a typical soil profile contains two distinct horizons. The first horizon occurs to a depth of 15 inches and contains loamy sand. The second horizon occurs to a depth of 60 inches and contains stratified gravelly loamy sand to gravelly loamy find sand. Available water storage is

[1] Published soil surveys are documented at a broad scale and they may not match the level of detail or refinement captured during formal soil surveys.

low (about 3.4 inches), and the runoff class is negligible. This soil is rarely prone to flooding, not prone to ponding, and it is not considered hydric (USDA, NRCS 2023b). It covers approximately 5 percent of the Study Area where it is mapped adjacent to the wash that is north of Component 1.

Gorgonio Loamy Sand, Channeled, 2 to 15 Percent Slopes (GkD)

GkD is a somewhat excessively drained soil that is found in alluvial fans. It is an alluvium soil that is derived from granite and a typical soil profile contains two distinct horizons. The first horizon occurs to a depth of 15 inches and contains loamy sand. The second horizon occurs to a depth of 60 inches and contains stratified gravelly loamy sand to gravelly loamy fine sand. Available water storage is low (about 3.4 inches), and the runoff class is negligible. This soil is rarely prone to flooding, not prone to ponding, and is considered hydric (USDA, NRCS 2023b). It covers approximately 5 percent of the Study Area where it is mapped within the wash that is north of Component 1.

Hanford Coarse Sandy Loam, 2 to 8 Percent Slopes (HcC)

HcC is a well-drained soil that is found in alluvial fans. It is an alluvium soil that is derived from granite and a typical soil profile contains three distinct horizons. The first horizon occurs to a depth of 8 inches and contains coarse sandy loam, the second horizon occurs to a depth of 40 inches and contains find sandy loam, and the third horizon occurs to a depth of 60 inches and contains stratified loamy sand to coarse sandy loam. Available water storage is moderate (about 7 inches), and the runoff class is low. This soil is not prone to flooding or ponding and it is not considered hydric (USDA, NRCS 2023b). It covers approximately 2 percent of the Study Area where it is mapped adjacent to the wash on the west side of Component 1.

Rockland (RtF)

RtF occurs along rocky slopes. It is a residuum substrate that contains boulders, cobble, and other sizes of rock that are derived from mixed parent sources. It is not considered hydric (USDA, NRCS 2023b). It covers approximately 5 percent of the Study Area where it is mapped on the rocky slopes within and surrounding Component 2 and along the rocky slopes adjacent to Component 7.

Vista Coarse Sandy Loam, 15 to 35 Percent Slopes, Eroded (VsF2)

VsF2 is a well-drained soil that is found along hills. It is a residuum soil that is derived from weathered granite or granodiorite and a typical soil profile contains three distinct horizons. The first two horizons occur to a depth of 24 inches and contain coarse sandy loam and the third horizon occurs to a depth of 28 inches and contains weathered bedrock. Available water storage is very low (about 2.4 inches), and the runoff class is low. It is not prone to flooding or ponding and it is not considered hydric (USDA, NRCS 2023b). It covers approximately 3 percent of the Study Area where it is mapped along a hillside within and adjacent to the northern portion of Component 3.

Vista Rocky Coarse Sandy Loam, 2 to 35 Percent Slopes, Eroded (VtF2)

VtF2 is a well-drained soil that is found along hillsides. It is a residuum soil that is weathered from granodiorite and/or granite and a typical soil profile contains three distinct horizons. The first two horizons occur to a depth of 24 inches and contain coarse sandy loam and the third horizon occurs to a depth of 28 inches and contains weathered bedrock. Available water storage is very low (about 2.4 inches), and the runoff class is low. This soil is not prone to flooding or ponding and it is not considered hydric (USDA, NRCS 2023b). It covers approximately 5 percent of the Study Area where it is mapped on hillsides within and surrounding Components 4 and 6.

Hydrology

The Study Area is within the Saint Johns Canyon Subwatershed (Hydrologic Unit Code [HUC] 12-180702020301). One unnamed ephemeral stream (i.e., ES1) with an unnamed ephemeral tributary (i.e., ES2) is located within the Study Area. ES1 travels from east to west through Avery Canyon in the Study Area. Its headwaters are located further up Avery Canyon approximately 1.5 miles east of the Component 1 Study Area and the stream travels west through the Component 1 and Component 2 Study Areas. ES1 continues down Avery Canyon to the west after exiting the Component 2 Study Area for approximately 1.2 miles before discontinuing within an agricultural field. ES1 takes the form of a wash within the Component 1 Study Area and is contained within a defined stream channel within the Components 2 and 6 Study Areas. Both locations support riparian vegetation and contain sand in both locations. The NWI identifies ES1 as an intermittent riverine streambed that is seasonally flooded and the NHD identifies ES1 as ephemeral. Upon examination in the field, it was determined that ES1 likely only contains flow during and shortly following rain events (i.e., around 14 days). ES1 is approximately 70 feet wide on average where it is a wash adjacent to Component 1 and channelizes as it exits Component 1's Study Area. The stream's ordinary high water mark (OHWM) channel is approximately 4 feet wide within the Component 2 Study Area.

ES2 is a small ephemeral stream that originates about halfway up the Component 3 Study Area. It travels from south to north down the north aspect of Polly Butte. The stream contains a definable bed and bank on the southwest side of the Component 3 Project Area (i.e., Gibbel Road) and surface flows across the work area to the north side and into a gully. The stream was not definable anywhere else within the Study Area and likely connects to ES1 near the Component 1 Study Area through a combination of subsurface and sheet flows. ES2 contained sandy soils within its channel and supports trace amounts of riparian vegetation. The NWI identifies ES2 as an intermittent riverine streambed that is seasonally flooded and the NHD identifies ES2 as ephemeral. Upon examination in the field, it was determined that ES2 likely only flows during and immediately following rain events. The extent of its OHWM is approximately 2 to 3 feet wide where it is definable. The potential jurisdictional extents of the streams are discussed in the Potentially Jurisdictional Waters section below and the limits of their potential jurisdictions are depicted in Figure 5.

Vegetation Communities and Land Cover Types

A total of 13 vegetation communities and land cover types were documented within the Study Area during the field survey. Table 1 lists each vegetation community and land cover type documented and provides their approximate acreage and the percent area covered in the Study Area. Attachment 1, Figure 4 depicts the locations of each vegetation community and land cover type in the Study Area. Brief descriptions of the vegetation communities and land cover types are provided in the subsections below and representative photographs are provided in Attachment 2.

The vegetation classification used for this analysis is based on *A Manual of California Vegetation, Second Edition* (MCV2; Sawyer et al. 2009). The land cover types that are not described in MCV2 were classified using conventional naming practices (e.g., developed/landscaped and disturbed).

Table 1 Summary of Vegetation Communities/Land Cover Types within the Study Area

Type	Approximate Acreage	Approximate Percent Area
Brittle Bush Scrub	1.12	3
California Buckwheat Scrub	0.59	1
Disturbed California Buckwheat Scrub	0.56	1
California Sycamore - Coast Live Oak Riparian Woodland*	0.48	1
Disturbed California Sycamore - Coast Live Oak Riparian Woodland	0.53	1
Coast Live Oak Woodland	0.44	1
Disturbed Coast Live Oak Woodland	2.75	7
Developed/Landscaped	12.91	32
Disturbed	7.73	19
Eucalyptus Grove	0.42	1
Disturbed Mulefat Thicket	1.19	3
Wild Oats and Annual Brome Grassland	3.19	8
Disturbed Yerba Santa Scrub	8.07	20
Total	**39.98**	**100%**

*Indicates a CDFW Sensitive Natural Community

Brittle Bush Scrub

Brittle bush scrub (*Encelia farinosa* Shrubland Alliance) is a coastal scrub vegetation community that is typically found on alluvial fans, bajadas, colluvium, rocky hillsides, and slopes of small washes and rills. Soils are well drained, rocky, and may be covered by desert pavement. This alliance is generally found between 246 and 4,594 feet amsl. Brittle bush scrub is characterized by an open to intermittent shrub canopy and a seasonal herbaceous layer. Brittle bush (*Encelia farinosa*) must have over one percent absolute cover and 30 percent relative cover in the shrub layer (Sawyer et al. 2009). This vegetation community is not considered sensitive by the CDFW (2023c).

This vegetation community is located within the unburned areas adjacent to Component 2 in the western portion of the Study Area and adjacent to Component 4 in the southern portion of the Study Area. It is dominated by brittle bush with California buckwheat (*Eriogonum fasciculatum*) present as a common associate. Shrub canopy coverage is intermittent to continuous, and the herbaceous understory is sparse and dominated by non-native grasses typical of the wild oats and annual brome grassland when present.

California Buckwheat Scrub

California buckwheat scrub (*Eriogonum fasciculatum* Shrubland Alliance) is a coastal scrub vegetation community that is typically found on upland slopes, intermittently flooded arroyos, and channels and washes. Soils are typically course, well drained, and moderately acidic to slightly saline. California buckwheat is the dominant species and must contain at least 50 percent relative cover in the shrub layer (Sawyer et al. 2009). Common associates include California sagebush (*Artemisia californica*), coyote brush (*Baccharis pilularis*), and other common coastal sage scrub plant species. This vegetation community is not considered sensitive by the CDFW (2023c).

This vegetation community is located along the hillsides adjacent to Component 7 within the southern portion of the Study Area. It is dominated by California buckwheat with brittle bush and thickleaf yerba santa (*Eriodictyon crassifolium*) present as common associates. Shrub canopy coverage is intermittent to continuous, and the herbaceous understory is sparse and dominated by non-native grasses typical of wild oats and annual brome grassland when present.

Disturbed California Buckwheat Scrub

A disturbed form of California buckwheat scrub is present along the recovering burned slopes adjacent to the Component 3 Project Area in the southern portion of the Study Area. This vegetation community generally contains the same species composition as California buckwheat scrub. However, it has less absolute cover of all native coastal scrub species and a larger degree of non-native annual forbs and grasses, which have a species composition typical of the disturbed land cover type and wild oats and annual brome grassland. Over time, it is anticipated that this vegetation community will succeed back into its non-disturbed form. The disturbed form of this vegetation community is not recognized in the MCV2 (Sawyer et al. 2009).

California Sycamore - Coast Live Oak Riparian Woodland

California sycamore – Coast live oak riparian woodland (*Platanus racemosa - Quercus agrifolia* Woodland Alliance) is typically found in perennially moist soils along gullies, intermittent streams, stream banks, and terraces adjacent to floodplains. California sycamore (*Platanus racemosa*) and/or coast live oak (*Quercus agrifolia*) is dominant or codominant in the tree canopy where California sycamore must have greater than 30 percent relative cover, or coast live oak must have greater than 50 percent relative cover and occur within a riparian setting (Sawyer et al. 2009). This vegetation community is considered sensitive by the CDFW (2023c).

This vegetation community is located within the unburned portion of the drainage ES1, adjacent to Component 2 in the western portion of the Study Area. It is dominated by coast live oak and California sycamore in the tree stratum and the shrub stratum is generally absent. The herbaceous layer provides intermittent coverage and is dominated by non-native grasses and forbs typical of the wild oats and annual brome grassland, when present.

Disturbed California Sycamore - Coast Live Oak Riparian Woodland

Disturbed California sycamore - coast live oak riparian woodland is found adjacent to ES1 within the Component 6 Study Area. It is actively recovering from impacts related to the Fairview Fire. It is dominated by coast live oak and California sycamore in the tree stratum with blue elderberry (*Sambucus mexicana*) and Fremont cottonwood (*Populus fremontii*) present as common associates. All tree species contain low cover. The herbaceous understory contains dense coverage and is dominated by native and non-native weedy forb species such as common sunflower (*Helianthus annuus*), western ragweed (*Ambrosia psilostachya*), and sacred datura (*Datura wrightii*). The disturbed form of this vegetation community is not recognized in the MCV2 (Sawyer et al. 2009).

Coast Live Oak Woodland

Coast live oak woodland (*Quercus agrifolia* Woodland Alliance) is a temperate woodland vegetation community that occurs along canyon bottoms, slopes, and flats. Associated soils are deep, high in organic matter, and contain sand or loam. Coast live oak is dominant or codominant in the tree canopy where it must contain 50 percent or greater relative cover. Common co-dominants and associates include big leaf maple (*Acer macrophyllum*), valley oak (*Quercus lobata*), and California bay (*Umbellularia californica*). The tree canopy is open to continuous, the shrub layer is sparse to intermittent, and the herbaceous layer is sparse to continuous.

This vegetation community is located within a small, unburned gully adjacent to the Component 3 Project Area in the eastern portion of the Study Area. It is dominated by coast live oak in the tree stratum and contains continuous to intermittent canopy cover. The shrub stratum contained intermittent canopy cover and is dominated by California brickellbush (*Brickellia californica*). The herbaceous understory contained variable cover and was dominated by weedy native forbs such as common sunflower and western ragweed.

Disturbed Coast Live Oak Woodland

The Study Area contains a disturbed form of coast live oak woodland down slope of the coast live oak woodland and on the north-facing slopes adjacent to the Component 3 Project Area. The disturbed form of this vegetation community was heavily impacted by the Fairview Fire and is comprised of dead and recovering coast live oaks in the tree canopy with low cover. The shrub stratum contains sparse coverage and is dominated by thickleaf yerba santa. The herbaceous understory contains intermittent to continuous cover and is dominated by weedy native and non-native species such as common sunflower, clustered tarweed (*Deiandra fasciculata*), western ragweed, short-podded mustard (*Hirschfeldia incana*) and brome (*Bromus* spp.). This land cover type is not recognized in the MCV2 (Sawyer et al. 2009).

Developed/Landscaped

The developed land cover type consists of areas that have been developed or otherwise physically altered to the extent that they no longer support most vegetation. Developed land is characterized by the presence of permanent or semi-permanent structures, gravel lots, pavement, or hardscape. The landscaped land cover type consists of human-altered vegetative landscapes for aesthetic or recreational purposes that are typically adjacent to developed areas. Developed/landscaped is not officially identified in MCV2 (Sawyer et al. 2009).

This land cover type is located within the rural developed areas within and adjacent to Gibbel Road throughout the Study Area. It contains structures, hardscapes, and adjacent landscape/ornamental vegetation. The ornamental species composition varied but was generally dominated by Mexican fan palm (*Washingtonia robusta*), Aleppo pine (*Pinus halepensis*), Peruvian pepper tree (*Schinus molle*), and oleander (*Nerium oleander*).

Disturbed

Disturbed land refers to any land where the native vegetation has been significantly altered by agriculture, construction, or other anthropogenic activities; and the species composition and site conditions are not characteristic of the disturbed phase of a particular vegetation community (e.g., disturbed California buckwheat scrub). Disturbed land is typically found in vacant lots, roadsides, material storage areas, or abandoned fields, and is often dominated by non-native species and/or bare ground. This land cover type is not officially identified in the MCV2 (Sawyer et al. 2009).

This land cover type is found throughout the Study Area in areas that were heavily impacted by the Fairview Fire, in disked or mowed fields, and in areas that primarily contain bare ground with sparse vegetative coverage. It contains sparse to intermittent canopy coverage and is dominated by non-native and native forbs such as short-podded mustard, clustered tarweed, sacred datura, and slender buckwheat (*Eriogonum gracile*) depending on location.

Eucalyptus Groves

Eucalyptus groves (*Eucalyptus* spp. Woodland Semi-Natural Alliance) is a naturalized temperate woodland vegetation community that was originally planted as groves or windbreaks throughout California. This alliance has since become naturalized throughout the state in uplands and bottomlands and are also frequently found adjacent to stream courses, lakes, or levees. This vegetation community is dominated by eucalyptus trees (*Eucalyptus* spp.) where it must have greater than 80 percent cover in the tree stratum. The shrub and herbaceous layers are sparse to intermittent.

This vegetation community is located along the drainage adjacent to Component 1 in the northeastern portion of the Study Area. It is dominated by red gum eucalyptus (*Eucalyptus camaldulensis*) where it contains nearly continuous canopy coverage. The shrub stratum is absent, and the herbaceous understory is sparse and is dominated by non-native grasses typical of wild oats and annual brome grassland when present.

Disturbed Mulefat Thickets

Mulefat thickets (*Baccharis salicifolia* Shrubland Alliance) is a riparian scrub vegetation community that grows in mixed alluvium soil types. It is typically found in canyon bottoms, floodplains, irrigation ditches, lake margins, and stream channels. It is dominated by mulefat (*Baccharis salicifolia*), where it must have greater than 50 percent relative cover in the shrub canopy with blue elderberry (*Sambucus mexicana*) present as a common associate (Sawyer et al. 2009). The canopy coverage is generally continuous and other common associates include other species of baccharis (*Baccharis* spp.), arrow weed (*Pluchea sericea*), and willows (*Salix* spp.). Emergent trees may be present at low cover and the herbaceous layer is typically sparse.

A disturbed form of this vegetation community is located within the wash just north of Component 1. The area is recovering from the Fairview Fire and is dominated by mulefat in the shrub stratum, but at low cover. Common associates in the shrub stratum include blue elderberry and red willow (*Salix laevigata*). The herbaceous layer generally contains continuous cover and was dominated by weedy native species such as common sunflower, western ragweed, and mugwort (*Artemisia douglasiana*). A few emergent California sycamores are present but at low cover.

Wild Oats and Annual Brome Grassland

Wild oats and annual brome grassland is an open-to-dense naturalized vegetation community that occurs in a large variety of topographic settings. It is dominated or codominated by non-native, often invasive, annual grasses (e.g., wild oats [*Avena* spp.], ripgut brome [*Bromus diandrus*], and foxtail barley [*Hordeum murinum*]). This vegetation community is often interspersed with native and non-native forbs. Emergent trees and shrubs may be present but at low cover.

This vegetation community is located within and adjacent to the Component 6 Project Area and adjacent to the Component 7 Project Area in the western portion of the Study Area. It contains nearly continuous coverage and is dominated by ripbut brome, wild oats, and red brome (*Bromus rubens*). Some non-native annual forbs are present but at low cover.

Disturbed Yerba Santa Scrub

Yerba santa scrub (*Eriodictyon* spp. Shrubland Alliance) is a coastal scrub vegetation community that typically occurs in exposed areas along slopes and ridges and is often found following recent disturbances, such as fire or floods. It is dominated by yerba santa (*Eriodictyon* spp.) where it must have greater than 50 percent relative cover in the shrub canopy (Sawyer et al. 2009). Common associates include other species typical of coastal scrub vegetation communities such as California buckwheat, coyote brush, and California sagebrush. The canopy coverage is open to intermittent and emergent trees may be present, but at low cover.

A disturbed form of this vegetation community is located within the rocky exposed slopes throughout the Study Area in areas actively recovering from the Fairview Fire. The shrub stratum contains a low absolute cover and is dominated by thickleaf yerba santa. Common associates include chapparal bush mallow (*Malacothamnus fasciculatus*), deer weed (A*cmispon glaber*), and brittle bush. The herbaceous understory contains intermittent to continuous cover and is dominated by non-native annual grasses and some emergent herbaceous forbs, both typical of wild oats and annual brome grassland.

General Wildlife

Common coastal sage scrub, cismontane woodland, and urban wildlife species were observed during the field survey. The most notable and abundant species observed included California quail (*Callipepla californica*), Cassin's kingbird (*Tyrannus vociferans*), northern mockingbird (*Mimus polyglottos*), California towhee (*Melozone crissalis*), and rock wren (*Salpinctes obsoletus*). A complete list of all plant and wildlife species observed in the Study Area is provided in Attachment 3.

4 Regulated Biological Resources

Local, state, and federal agencies regulate special status species and generally require an assessment of their presence or potential presence to be conducted prior to the approval of a proposed project. This section discusses sensitive or regulated biological resources observed within the Study Area and evaluates the potential for the Study Area to support additional regulated biological resources. Assessments for the potential occurrence of special-status species are based upon known ranges, habitat preferences for the species, species occurrence records (e.g., CNDDB) from other sites in the vicinity of the Project Area, previous reports from nearby projects, and the Project survey results. The potential for each special-status species to occur in the Study Area was evaluated according to the following criteria:

- **No Potential**. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime), and species would have been identifiable on the site if present.
- **Low Potential**. Few of the habitat components (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime) meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not very likely to occur on the site.
- **Moderate Potential**. Some of the habitat components (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime) meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. There are confirmed extant populations in the regional vicinity without barriers to dispersal. The species has a moderate probability of occurring on the site.
- **High Potential**. All the habitat components (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime) meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. There are confirmed extant populations in the immediate vicinity without barriers to dispersal. The species has a high probability of occurring on the site.
- **Present**. Species was observed on the site or has been recorded (e.g., CNDDB, other reports) on the site recently (within the last five years) with no significant changes to the site.

Special-Status Species

The literature and database review identified records of 86 special-status plant and animal species in the vicinity of the Study Area (Attachment 4). Of these 86 species, one plant species was observed, and 32 species (13 plants and 19 animals) are considered to have some potential to occur in the Study Area. Each of these 33 special-status species, its listing or rarity status, and its potential to occur is included in Table 2. Details on the special-status species with a potential to occur in the Study Area are broken out by plants and wildlife in the subsections below.

Table 2 Special-Status Species with Potential to Occur within the Study Area

Scientific Name	Common Name	Status[1]	Potential to Occur
Plants			
Abronia villosa var. *aurita*	Chaparral sand-verbena	CRPR 1B.1	Present
Astragalus pachypus var. *jaegeri*	Jaeger's milk-vetch	CRPR 1B.1	Moderate
Calochortus weedii var. *intermedius*	Intermediate mariposa-lily	CRPR 1B.2	Low
Chorizanthe parryi var. *parryi*	Parry's spineflower	CRPR 1B.1	High
Chorizanthe polygonoides var. *longispina*	Long-spined spineflower	CRPR 1B.2	Low
Chorizanthe xanti var. leucotheca	White-bracted spineflower	CRPR 1B.2	Moderate
Deinandra mohavensis	Mojave tarplant	SE; CRPR 1B.3	High
Dodecahema leptoceras	Slender-horned spineflower	FE; SE; CRPR 1B.1	Moderate
Imperata brevifolia	California satintail	CRPR 2B.1	Low
Nama stenocarpa	Mud nama	CRPR 2B.2	Low
Pseudognaphalium leucocephalum	White rabbit-tobacco	CRPR 2B.2	Low
Saltugilia latimeri	Latimer's woodland-gilia	CRPR 1B.2	Low
Symphyotrichum defoliatum	San Bernardino aster	CRPR 1B.2	Low
Tortula californica	California screw moss	CRPR 1B.2	Low
Invertebrates			
Bombus crotchii	Crotch bumble bee	SCE	High
Euphydryas editha quino	Quino checkerspot butterfly	FE	Low
Amphibians			
Spea hammondii	Western spadefoot toad	FCT; SSC	Low
Reptiles			
Anniella stebbinsi	Southern California legless lizard	SSC	Moderate
Arizona elegans occidentalis	California glossy snake	SSC	Moderate
Aspidoscelis tigris stejnegeri	Coastal whiptail	SSC	Moderate
Coleonyx variegatus abbotti	San Diego banded gecko	SSC	Low
Crotalus ruber	Red-diamond rattlesnake	SSC	Moderate
Phrynosoma blainvillii	Coast horned lizard	SSC	Moderate
Salvadora hexalepis virgultea	Coast patch-nosed snake	SSC	Low
Birds			
Aquila chrysaetos	Golden eagle	FP	Low
Lanius ludovicianus	Loggerhead shrike	SSC	Low
Polioptila californica californica	Coastal California gnatcatcher	FT; SSC	Moderate
Setophaga petechia	Yellow warbler	SSC	Low

Scientific Name	Common Name	Status[1]	Potential to Occur
Mammals			
Antrozous pallidus	Pallid bat	SSC	Low (roosting) Moderate (foraging)
Chaetodipus fallax fallax	Northwestern San Diego pocket mouse	SSC	High
Lasiurus xanthinus	Western yellow bat	SSC	Low
Neotoma lepida intermedia	San Diego desert woodrat	SSC	Moderate
Perognathus longimembris brevinasus	Los Angeles pocket mouse	SSC	Low

[1] FE = Federally Endangered FCT = Federal Candidate Threatened FP = State Fully Protected
FT = Federally Threatened SCE = State Candidate Endangered SE = State Endangered
SSC = CDFW Species of Special Concern

Special-Status Plant Species

Based on the results of the literature and database review and field survey, one special-status plant species is present and 13 special-status plant species have some potential to occur in the Study Area. Table 2 includes each special-status plant species, its listing or rarity status, and its potential to occur. Of these 14 species, six species were determined to be present or have a high or moderate potential to occur and are discussed in more detail below. The eight special-status plant species with a low potential to occur are not discussed further in this document since they are not listed on the ESA or CESA and do not receive consideration under CEQA. The remaining special-status plant species identified during the literature and database review are not anticipated to occur based on a variety of factors, including the lack of suitable habitat, soils, or other necessary microhabitat conditions, and/or the Study Area location in relation to the species' known geographic and/or elevational range. Attachment 4 contains additional information for each potentially occurring special-status species identified during the literature and database review, their listing statuses, their habitat requirements, populations in the region, observations of habitat suitability, and their likelihood of occurrence in the Study Area.

Chaparral Sand-Verbena

Chaparral sand-verbena (*Abronia villosa* var. *aurita*), a CRPR 1B.1 species, is an annual herb that is typically found in coastal Southern California. It grows on sandy soils in coastal scrub and chaparral at elevations between 250 to 5,250 feet amsl. It blooms from March through August.

Suitable coastal scrub habitat with sandy soils is present within the Study Area and the Study Area is within this species' documented geographic and elevational range. Additionally, this species was observed in the Study Area during the field survey adjacent to Component 1. Therefore, this species is assumed to be present in coastal scrub with sandy soils in the Study Area with a known presence surrounding the wash north of Component 1. The location of the observation of this species is depicted in Attachment 1, Figure 4.

Jaeger's Milk-Vetch

Jaeger's milk-vetch (*Astragalus pachypus* var. *jaegeri*), a CRPR 1B.1 species, is a perennial subshrub that is typically found within the Peninsular Range of Southern California. It grows on rocky or sandy areas in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland at elevations between 1,200 to 3,200 feet amsl. It blooms from December through June.

Suitable woodland, coastal scrub, and valley and foothill grassland habitat with rocky and sandy soils are present within the Study Area and the Study Area is within this species' documented geographic and elevational range. Additionally, this species has been documented multiple times within the nine-quadrangle search area (CDFW 2023a). However, the majority of the Study Area has recently burned and is disturbed or in an early seral stage. Therefore, this species has a moderate potential to occur within the woodlands, grasslands, and coastal scrub habitat in the Study Area.

Parry's Spineflower

Parry's Spineflower (*Chorizanthe parryi* var. *parryi*), a CRPR 1B.1 species, is an annual herb typically found in the Transverse and Peninsular Ranges of Southern California. It grows in openings with sandy soils in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland at elevations between 900 to 4,000 feet amsl. It blooms from April through June.

Suitable woodland, coastal scrub, and valley and foothill grassland habitat with sandy openings are present within the Study Area and the Study Area is within this species' documented geographic and elevational range. Additionally, this species has been documented multiple times within the nine-quadrangle search area with two occurrences documented less than 2 miles west of the Study Area (Calflora 2023). Therefore, this species has a high potential to occur within the sandy openings of the woodlands, coastal scrub, and valley and foothill grasslands in the Study Area.

White-Bracted Spineflower

White-bracted Spineflower (*Chorizanthe xanti* var. *leucotheca*), a CRPR 1B.2 species, is an annual herb that is typically found within the San Bernardino and San Jacinto Mountains in Southern California. It grows in sandy or gravelly soils in alluvial fans of coastal scrub, Mojavean desert scrub, and pinyon and juniper woodland at elevations between 975 to 3,950 feet amsl. It blooms from April to June.

Suitable alluvial fans and coastal scrub habitat with sandy and gravelly soils is present within the Study Area and the Study Area is within this species' documented geographic and elevational range. Additionally, this species has been recently documented approximately 5 miles northwest of the Study Area (Calflora 2023). However, this species is most commonly found in Mojavean desert scrub and pinyon and juniper woodlands. Therefore, this species has a moderate potential to occur within the wash north of Component 1 in the Study Area.

Mojave Tarplant

Mojave tarplant (*Deinandra mohavensis*), a CESA Endangered and CRPR 1B.3 species, is an annual herb typically found in the Mojave Desert and the Peninsular Ranges of California. It grows in moist sites and in openings of chaparral, coastal scrub, desert scrub, riparian scrub and grasslands at elevations between 2,100 to 5,250 feet amsl. It is most commonly found in riparian areas or in ephemeral grassy areas and it blooms from June through October.

Suitable riparian scrub, coastal scrub, and grassland habitat with moist sites and openings are present in the Study Area and the Study Area is within this species' documented geographic and elevational range. Additionally, this species has been documented several times within 5 miles of the Study Area, with the closest observation less than 1 mile east of the Study Area (Calflora 2023).

Therefore, this species has a high potential to occur within the wash and adjacent coastal scrub with moist soil north of Component 1.

Slender-Horned Spineflower

Slender horned Spineflower (*Dodecahema leptoceras*), an ESA and CESA Endangered species and a CRPR 1B.1 species, is an annual herb typically found in the Transverse and Peninsular Ranges of Southern California. It grows in sandy or gravelly soil in flood deposited terraces and washes at elevations between 650 to 2,500 feet amsl. It blooms from April through June.

Suitable sandy soils within flood deposited terraces and a wash is present within the Study Area and the Study Area is within this species' documented geographic and elevational range. Additionally, this species has been documented four separate times approximately 5 miles east of the Study Area (Calflora 2023). However, the wash does contain a degree of disturbance from the Fairview Fire and adjacent land use. Therefore, this species has a moderate potential to occur within the wash and its flood deposited terraces north of Component 1.

Special-Status Wildlife Species

Based on the results of the literature and database review and field survey, 19 special-status wildlife species have some potential to occur in the Study Area (Attachment 4). Table 2 includes each of these special-status wildlife species, its listing status, and its potential to occur. Of these 19 species, four ESA/CESA-listed or CDFW FP species have a high, moderate, or low potential to occur; and eight CDFW SSC have a high or moderate potential to occur. These species are discussed in more detail in the subsections below. The eight CDFW SSC with low potential to occur are not discussed further in this document since they do not receive consideration under CEQA. The special-status wildlife species identified during the literature and database review that are not anticipated to occur are based on a variety of factors, including the lack of suitable habitat and/or the Study Area location in relation to the species' known geographic and/or elevational range. Species which are likely to only traverse through the area during limited foraging or migratory periods were not considered to have a potential to occur in the Study Area. Attachment 4 contains additional information for each potentially occurring special-status species identified during the literature and database review, their listing statuses, their habitat requirements, populations in the region, observations of habitat suitability, and their likelihood of occurrence in the Study Area.

Crotch Bumble Bee

Crotch bumble bee (*Bombus crotchii*), a CESA candidate species, inhabits grassland and scrub habitats in arid climates from coastal California east to the Sierra-Cascade Crest and south into Mexico. It is a subterranean nester and has been documented to frequently nest in abandoned rodent dens. It visits a wide range of host plants and is therefore considered a dietary generalist.

Suitable grassland and scrub habitat is present in the Study Area and the Study Area is within this species' documented geographic and elevational range. Additionally, this species has been documented multiple times within the nine-quadrangle search area with the closest record approximately 2.25 miles north of the Study Area (CDFW 2023a). Specific host plants are not a requirement for this species as it can utilize a variety of plants as food sources. Therefore, this species has a high potential to occur within the coastal scrub and grassland vegetation communities in the Study Area.

Quino Checkerspot Butterfly

Quino checkerspot butterfly (QCB; *Euphydryas editha quino*), an ESA Endangered species, inhabits sunny openings within chaparral and coastal sage scrub on hills and mesas near the coast in parts of Riverside and San Diego Counties between 850 to 1,700 feet amsl. It is a dietary specialist and requires high densities of its food plants (i.e., California plantain [*Plantago erecta*], wooly plantain [*Plantago ovata* var. *insularis*], and owl's clover [*Orthocarpus purpurescens*]).

Sunny openings within coastal scrub are present in the Study Area and the Study Area is within the species' USFS documented geographic range. This species has been documented multiple times within the nine-quadrangle search area (CDFW 2023a). However, it prefers rolling hills and mesa landforms, and the Study Area is moderately mountainous containing a copious amount of boulders and rock outcroppings. Additionally, the Study Area is slightly outside of this species' documented elevational range and the vegetation communities present recently burned and are generally disturbed or in an early seral stage. No host plants were observed during the field survey; however, it was conducted outside of their blooming period. This species is considered to have a low potential to occur within the coastal scrub and adjacent grassland vegetation communities in the Study Area.

Southern California Legless Lizard

Southern California legless lizard (*Anniella stebbinsi*), a CDFW SSC, is generally found from the Transverse Range of Southern California south to northwestern Baja California. It is found from sea level up to approximately 6,000 feet amsl in a variety of vegetation communities. It prefers sandy or loose loamy soils that contain sparse vegetative cover within coastal dune, valley-foothill chaparral, and coastal scrub vegetation communities. Moist and loose soil as well as leaf litter are essential habitat components.

Suitable sandy and loose soils with sparse vegetation coverage are present in the Study Area and the Study Area is within this species' documented geographic and elevational range. Additionally, sandy and moist soils are present surrounding the wash north of Component 1 and within the drainage adjacent to Component 2. This species has also been documented multiple times within the nine-quadrangle search area (CDFW 2023a). The majority of the suitable habitat within the Study Area has recently burned and is disturbed or in an early seral stage. This species is considered to have a moderate potential to occur within the sandy portions of the coastal scrub and riparian scrub vegetation communities adjacent to Component 1 and within and surrounding the drainage adjacent to Component 2.

California Glossy Snake

California glossy snake (*Arizona elegans occidentalis*), a CDFW SSC, is patchily distributed from the eastern portion of the San Francisco Bay south through the Central Valley and South Coast to Baja California. It is found from sea level up to approximately 6,000 feet amsl in variety of scrub and grassland vegetation communities. Open areas with loose soil for burrowing are essential habitat components.

Suitable scrub and grassland habitats with loose soil are present in the Study Area and the Study Area is within this species' documented geographic and elevational range. Additionally, this species has been documented several times within the nine-quadrangle search area (CDFW 2023a). However, the majority of the suitable habitat within the Study Area has recently burned and is disturbed or in an early seral stage. Therefore, this species has a moderate potential to occur within the coastal scrub and grassland vegetation communities in the Study Area.

Coastal Whiptail

Coastal whiptail (*Aspidoscelis tigris stejnegeri*), a CDFW SSC, is primarily found in coastal Southern California west of the Peninsular Range and south of the Transverse Range. It is found from sea level up to approximately 7,500 feet amsl in a variety of vegetation communities, but is most commonly found in chaparral, woodland, and riparian habitats. Hot and dry open areas with sparse foliage are essential habitat components.

Suitable woodland and riparian habitats with hot and dry open areas and sparse foliage are present in the Study Area and the Study Area is within this species' documented geographic and elevational range. Additionally, this species has been documented multiple times within the nine-quadrangle search area (CDFW 2023a). However, the majority of the suitable habitat within the Study Area has recently burned and is disturbed or in an early seral stage. Therefore, this species has a moderate potential to occur within the coastal scrub, woodland, and riparian vegetation communities in the Study Area.

Red-diamond Rattlesnake

Red-diamond rattlesnake (*Crotalus ruber*), a CDFW SSC, is found in coastal Southern California from southern San Bernardino County south through San Diego County. It is found from sea level up to approximately 3,000 feet amsl in chaparral, coastal scrub, woodland, and arid desert habitats in rocky areas that provide suitable cover such as dense patches of vegetation, rodent burrows, or rock cracks.

Suitable coastal scrub and woodland habitat with rocky areas, rodent burrows, and rock cracks are present in the Study Area and the Study Area is within this species' documented geographic and elevational range. Additionally, this species has been documented multiple times within the nine-quadrangle search area with one record located within the Study Area (CDFW 2023a). However, the majority of the suitable habitat within the Study Area has recently burned and is disturbed or in an early seral stage. Therefore, this species has a moderate potential to occur within the coastal scrub and woodland vegetation communities in the Study Area.

Coast Horned Lizard

Coast horned lizard (*Phrynosoma blainvillii*), a CDFW SSC, is found throughout the Sierra Nevada foothills, the Central Valley, and the coast ranges of California. It is found from sea level up to approximately 6,000 feet amsl in a variety of vegetation communities including coastal scrub, chaparral, valley-foothill woodlands, annual grasslands, and open riparian woodlands, but is most commonly found in lowlands along sandy washes with scattered low bushes. This species requires open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.

This species' required habitat components are present in the coastal scrub, woodlands, and grasslands in the Study Area and the Study Area is within this species' documented geographic and elevational range. Additionally, this species has been documented multiple times within the nine-quadrangle search area (CDFW 2023a). However, the majority of the suitable habitat within the Study Area has recently burned and is disturbed or in an early seral stage. Therefore, this species has a moderate potential to occur within the coastal scrub, woodlands, and grassland vegetation communities in the Study Area.

Golden Eagle

Golden eagle (*Aquila chrysaetos*), a CDFW FP species, is known to occur throughout the majority of California where suitable habitat is present. They are most common within grasslands and oak savannahs adjacent to mountainous or hilly terrain. They are known to nest towards the peaks of mountainsides within rock ledges, outcrops of cliffs, and tall trees. They typically forage in large open terrain and their preferred diet consists of small to medium sized mammals.

Suitable rocky and hilly terrain is present in the Study Area and the Study Area is within this species' documented geographic and elevational range. However, golden eagles are unlikely to nest in the Study Area due to its proximity to developed areas. Additionally, with the exception of the vacant lot within the Component 1 Study Area, the Study Area is generally too mountainous, too dense, and too rocky to be suitable foraging habitat for this species. Therefore, this species has no potential to nest within the Study Area and a low potential to forage within the Component 1 Study Area.

Coastal California Gnatcatcher

Coastal California gnatcatcher (*Polioptila californica californica*), an ESA Threatened species and a CDFW SSC, is found in coastal Southern California from southern Ventura County south through San Diego County. It is found from sea level up to approximately 2,500 feet amsl in coastal sage scrub. This species is typically associated with California sagebrush, California buckwheat, and various species of sage (*Salvia* spp.).

Suitable coastal scrub habitat with California sagebrush, California buckwheat, and sage species is present in the Study Area and the Study Area is within this species' documented geographic and elevational range. Additionally, this species has been documented multiple times within the nine-quadrangle search area with the closest record located approximately 600 feet southwest of the Component 2 Study Area (CDFW 2023a). However, the habitat within the Study Area contains a moderate degree of anthropogenically induced and post fire disturbance and the vegetation communities within the Study Area are generally in an early seral stage. Nonetheless, this species has a moderate potential to nest and forage within the coastal scrub vegetation communities in the Study Area.

Pallid Bat

Pallid bat (*Antrozous pallidus*), a CDFW SSC, is a resident species of California and is most commonly found at elevations below 6,000 feet. While it is most common in open, dry habitats with rocky areas for roosting, it occurs over a wide variety of habitat types including grasslands, shrublands, and woodlands. It can be found roosting under bridges and sometimes in old structures such as barns. They are very sensitive to disturbance of their roost sites, and these sites must protect bats from high temperatures.

Suitable open dry habitat with rocky areas for roosting are present in the grasslands, coastal scrub, and woodlands in the Study Area and the Study Area is within this species' documented geographic and elevational range. However, this species is highly sensitive to disturbance at their roosting sites and the Study Area is located within and adjacent to developed areas. Therefore, this species has a low potential to roost within rock crevices in the Study Area and a moderate potential to forage within the grasslands, coastal scrub, and woodland vegetation communities in the Study Area.

Northwestern San Diego Pocket Mouse

Northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*), a CDFW SSC, is found in coastal Southern California primarily in San Diego and Riverside Counties. It is found from sea level up to approximately 4,500 feet amsl in coastal scrub, sagebrush scrub, grassland, and chaparral vegetation communities. It is most commonly found in open sandy areas and in areas with moderately gravelly or rocky substrates.

This species' preferred habitat components are found within the coastal scrub and grassland vegetation communities in the Study Area and the Study Area is within this species' documented geographic and elevational range. Additionally, this species has been documented multiple times within the nine-quadrangle search area (CDFW 2023a) and suitable pocket mouse (*Chaetodipus* spp.) burrows were observed throughout the Study Area. Therefore, this species has a high potential to occur within the coastal scrub and grassland vegetation communities in the Study Area.

San Diego Desert Woodrat

San Diego desert woodrat (*Neotoma lepida intermedia*), a CDFW SSC, is found in Southern California, the Great Basin, and the Mojave and Colorado Deserts. It is found from sea level up to approximately 8,500 feet amsl in a variety of shrub and arid scrub vegetation communities along with Joshua tree and pinyon juniper woodlands. This species builds large middens that are comprised of woody materials and herbaceous vegetation and are most commonly found in rocky and densely vegetated areas.

Suitable arid scrub and rocky habitat is present in the Study Area and the Study Area is within this species' documented geographic and elevational range. Additionally, this species has been documented multiple times within the nine-quadrangle search area with the closest record located approximately 0.25 mile north of the Study Area (CDFW 2023a). However, this species prefers moderately dense to dense canopy cover which is generally lacking from the Study Area due to the Fairview Fire and no woodrat middens were observed during the field survey. Nonetheless, this species has a moderate potential to occur within the coastal scrub vegetation communities in the Study Area.

Other Protected Species

Nesting Birds

The Study Area contains habitat that can support nesting birds, including raptors, protected under CFGC Section 3503 and the MBTA (16 United States Code Sections 703–712). Suitable nesting bird habitat within the Study Area includes the native and ornamental trees, snags, coastal scrub, rocky outcroppings, buildings, and grasslands.

Critical Habitat

The USFWS (USFWS 2023b) Critical Habitat Portal was reviewed for federally designated critical habitat in the vicinity of the Study Area. No federally designated critical habitat is located within the Study Area.

Wildlife Movement

Wildlife corridors, or habitat linkages, are generally defined as connections between habitat patches that allow for physical and genetic exchange between otherwise isolated animal populations. Such linkages may serve a local purpose, such as between foraging and denning areas, or they may be regional in nature, allowing movement across the landscape. Some habitat linkages may serve as migration corridors, wherein animals periodically move away from an area and then subsequently return. Others may be important as dispersal corridors for young animals. A group of habitat linkages in an area can form a wildlife corridor network.

The habitats in the linkage do not necessarily need to be the same as the habitats that are being linked. Rather, the linkage merely needs to contain sufficient cover and forage to allow temporary inhabitation by ground-dwelling species. Typically, habitat linkages are contiguous strips of natural areas, though dense plantings of landscape vegetation can be used by certain disturbance-tolerant species. Depending upon the species using a corridor, specific physical resources (e.g., rock outcroppings, vernal pools, or oak trees) may need to be in the habitat link at certain intervals to allow slower-moving species to traverse the link. For highly mobile or aerial species, habitat linkages may be discontinuous patches of suitable resources spaced sufficiently close together to permit travel along a route in a short period of time.

Most of the Study Area contains developed or disturbed land (e.g., existing roadways and rural residences) or is bisected by it. ES1 does provide a riparian corridor that could facilitate wildlife movement; however, the stream's channel and its associated habitat have been developed east of the Component 1 Study Area; therefore, disrupting the connectivity of the corridor throughout Avery Canyon and hindering the quality of the movement corridor. The natural and semi-natural vegetation communities that are located within the Study Area buffer do have the potential to provide refuge and food for migrating avian species as well as common reptiles and mammals. Therefore, the Study Area has the potential to support some level of localized wildlife movement.

Sensitive Natural Communities

Vegetation communities are considered sensitive biological resources if they have limited distributions, have high-wildlife value, include special-status species, or are particularly susceptible to disturbance. The CDFW ranks natural and sensitive communities using NatureServe's Heritage Methodology, the same system used to assign global and state rarity ranks for plant and animal species in the CNDDB. Plant communities with a rating of S1, S2, or S3 are all generally considered sensitive communities by the CDFW, though there are some exceptions.

California sycamore – coast live oak riparian woodland is ranked as S3 and is considered sensitive by the CDFW. No other vegetation communities in the Study Area are considered sensitive.

Potentially Jurisdictional Waters

ES1 and ES2 do not meet the United States Army Corps of Engineers (USACE) definition of a relatively permanent water (i.e., they do not contain flow for at least 3 months out of the year) and they do not have direct surface connection to a Navigable Water or a Traditional Navigable Water (TNW), thus ES1 and ES2 will likely not be considered waters of the U.S. However, since the Santa Ana Regional Water Quality Control Board (RWQCB) takes jurisdiction over all surface waters of the State up to the lateral extents of the OHWM, the channels of ES1 and ES2 within the OHWM will likely be considered non-wetland waters of the State pursuant to the Porter-Cologne Water Quality

Control Act. Additionally, since the CDFW takes jurisdiction over all surface waters of the State up to the lateral extents of the top of bank (TOB) or the edge of the riparian canopy, whichever is greater, the extent of ES1 and ES2's TOB or edge of riparian canopy, whichever is greater, will likely be considered CDFW jurisdictional streambeds pursuant to Section 1602 of the CFGC. The approximate jurisdictional extents of ES1 and ES2 are provided in Attachment 1, Figure 5[2].

Resources Protected by Local Policies and Ordinances

Protected Trees

According to Chapter 12.24 of the Riverside County Code, any native trees at or above 12 inches in diameter at breast height (DBH) above grade and 30 feet in height shall be protected above 5,000 feet amsl (County of Riverside 2023). Native trees with a DBH of 12 inches or greater with a height of 30 feet or more are present within the Study Area; however, the Study Area is below 5,000 feet amsl. Therefore, there are no protected trees within the Study Area per the Riverside County Code. However, CDFW takes jurisdiction over trees falling within the riparian corridor of the Study Area. Additionally, oak trees in the Study Area receive conservation consideration under the California Oak Woodland Conservation Act (California Wildlife Conservation Board 2001) and Riverside County Oak Tree Management Guidelines (1999).

Habitat Conservation Plans

The Study Area lies within the boundaries of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) and the ephemeral drainages within the Study Area likely meet the definition of riparian/riverine[3] under Section 6.1.2 of the Western Riverside County MSHCP. However, EMWD is not a Permittee under the MSHCP. The requirements of the MSHCP therefore do not directly apply to EMWD, meaning EMWD does not have to demonstrate consistency. However, pursuant to CEQA Guidelines Appendix G Checklist, Biological Resources criterion "f", EMWD cannot conflict with the MSHCP requirements.

The Study Area is also within the Stephen's Kangaroo Rat Mitigation Fee area. However, EMWD is not a signatory to the Stephens' Kangaroo Rat Habitat Conservation Plan (SKR HCP). Furthermore, the project is not expected to result in impacts to Stephens' kangaroo rat (*Dipodomys stephensi*). Therefore, the project would not conflict with the SKR HCP.

2 The jurisdictional extent of ES1 within the Component 1 Study Area was delineated by ELMT Consulting in October 2023.

3 Riparian/Riverine Areas are lands that contain habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source or areas with fresh water flow during all or a portion of the year (County of Riverside 2003).

5 Impact Analysis

Special-Status Species

Special-Status Plant Species

Six special-status plant species are present or have a high or moderate potential to occur within the Study Area. Table 2 includes these species, their listing or rarity status, and their potential to occur. Direct impacts resulting in mortality could occur to these species if they are present in the suitable disturbed mulefat thicket within the Component 1 Project Area and the northern staging area and the wild oats and annual brome grassland within the Component 6 Project Area during vegetation removal and grading activities. Additionally, indirect impacts could occur if they are present within the Project Area and/or Study Area through habitat modification resulting from the introduction of invasive plants during construction. Potential impacts to these species would be avoided and/or reduced through implementation of avoidance and minimization measure (AMM) BIO-1 in the Avoidance and Minimization Measures below. Based on the results of the special-status plant surveys recommended in AMM BIO-1, potential impacts to special-status plant species would be avoided or mitigated through the implementation of AMMs BIO-2 through BIO-5 or found to be less than significant without the need for additional AMMs.

In addition, if a CESA listed plant species is detected within the Project Area and cannot be avoided, consultation with the CDFW shall occur and the obtainment of an CESA Incidental Take Permit (ITP) would be required.

Special-Status Wildlife Species

Seven of the terrestrial wildlife SSC (Southern California legless lizard, California glossy snake, coastal whiptail, red-diamond rattlesnake, coast horned lizard, northwestern San Diego pocket mouse, and San Diego desert woodrat) that have a high or a moderate potential to occur within the Study Area could be impacted by the Project if they are present in the Study Area during construction. Direct impacts could occur to these species through trampling if foraging, burrowing, or estivating individuals are present within suitable habitat in the Project Area or intermittently move into the Project Area from suitable habitat during construction. Impacts to these non-listed species would be considered significant under CEQA if they jeopardize the viability of a local or regional population. Given the small Project footprint and limited impacts to potentially suitable habitat, the Project is unlikely to result in population-level impacts to these species. In addition, the presence of the extensive areas of suitable habitat surrounding the Study Area will continue to have the ability support robust populations of these species following construction. Therefore, the Project does not have the potential to jeopardize the continued existence of the regional populations of these species.

Impacts to day roosts or maternal roosts of pallid bat (SSC) are not anticipated since this species is unlikely to roost within the Study Area. Additionally, impacts are not anticipated to foraging individuals since this species is nocturnal and construction will take place during the day.

Impacts to nesting golden eagle (FP) are not anticipated since the species is unlikely to nest within the immediate vicinity of the Project Area. Additionally, impacts are not anticipated to foraging individuals since this species is highly mobile and there is an ample amount of higher quality foraging habitat located outside of the Study Area.

Crotch bumble bee (CESA candidate species) are an aerially mobile species and foraging individuals are unlikely to be impacted during construction. However, impacts to this species may occur through trampling if burrowing or nesting individuals are present within suitable wild oats and annual brome grassland or disturbed mulefat thickets within the Component 1 and 6 Project Areas and the northern staging area during construction. Impacts to Crotch bumble bee would be avoided or minimized with the implementation of AMMs BIO-2, BIO-4, and BIO-6 in the Avoidance and Minimization Measures section below. If an active colony is observed within the Study Area during AMM BIO-6, consultation with the CDFW will be required and a CESA ITP along with mitigation will be necessary prior to project implementation.

Mature QCBs (ESA Endangered) are an aerially mobile species and foraging individuals are unlikely to be impacted during construction. However, direct impacts are likely to occur if eggs, larvae, or pupae are present within suitable disturbed mulefat thicket habitat within the Component 1 Project Area and northern staging area or if they are present within the suitable wild oats and annual brome grassland within the Component 6 Project Area during construction through host plant damage or removal. Additionally, indirect impacts may occur if unoccupied host plants are removed through a reduction in suitable ovipositing habitat. Impacts to QCB would be avoided or minimized through the implementation of AMMs BIO-1, BIO-2, BIO-4, and BIO-7 in the Avoidance and Minimization Measures section below. If QCB is determined to be present within the Study Area, consultation with the USFWS will be required and an ITP or Statement along with mitigation will be necessary prior to project implementation.

Suitable coastal California gnatcatcher (ESA Threatened) habitat is not located within the Project Area; therefore, impacts to this species foraging and nesting habitat are not anticipated. However, Project-related impacts to this species could occur if an active nest is present within suitable nesting habitat in the brittle bush scrub, California buckwheat scrub, and disturbed yerba santa scrub adjacent to the Component 1 – 7 Project Areas and the northern and southern stagings areas and are abandoned due to Project-related disturbance. Impacts would be avoided or mitigated through the implementation of AMMs BIO-2 and BIO-8 in the Avoidance and Minimization Measures section below.

Indirect impacts could occur to all special status wildlife species with a potential to occur due to noise and dust generation during heavy equipment operation and through habitat loss due to the introduction of invasive plants. Potential indirect impacts to special-status wildlife species would be avoided or mitigated through the implementation of AMMs BIO-2, BIO-3, and BIO-5 in the Avoidance and Minimization Measures section below.

Other Protected Species

Nesting Birds

Multiple species of birds protected by the MBTA, and raptors protected under CFGC Section 3503 have the potential to nest throughout the Study Area. Direct impacts to these species may occur if active nests are present within the vegetation communities during their removal. Direct impacts will also occur if active nests are located within close vicinity to the Project Area and are abandoned due to visual and acoustic Project-related disturbance. Indirect impacts could result from the increase in noise and human presence if active nests are within the vicinity of construction and this disturbance could result in nest failure. Indirect impacts could also include habitat modifications by the introduction of invasive plants from construction equipment, resulting in loss of cover and foraging opportunities. Potential impacts to these species would be avoided or mitigated with implementation of AMMs BIO-2 and BIO-9 in the Avoidance and Minimization Measures section below.

Wildlife Movement

Project activities would generally be limited to the developed/landscaped and disturbed portions of the Study Area, which offer little to no value to wildlife movement. Additionally, construction related disturbance within the Study Area that could potentially deter wildlife movement would be temporary, limited to daytime hours, and an ample amount of suitable wildlife movement habitat is located outside of the Project Area. Therefore, significant impacts to wildlife movement are not anticipated.

Sensitive Natural Communities

The canopy of the California sycamore – coast live oak riparian woodland overhangs into the Component 2 Project Area (Attachment 1, Figure 4); however, the understory is comprised of bare ground, non-native annual grasses, and developed land and no trees in this community will be removed as a part of the Project. Therefore, no direct impacts to sensitive natural communities are anticipated. However, indirect impacts could result during and following the Project through the introduction of invasive plant species or from inadvertent contact with heavy machinery. Potential impacts would be avoided or mitigated through the implementation of AMMs BIO-2, BIO-3, and BIO-5 in the Avoidance and Minimization Measures section below.

Jurisdictional Waters

Impacts to jurisdictional waters as a result of the Project are not anticipated. The limits of the Component 1 Project Area and northern staging area avoid the jurisdictional limits of ES1 (as mapped by ELMT Consulting, Inc.), the Component 3 Project Area is entirely within Gibbel Road and therefore avoids the jurisdictional limits of ES2, and all work within the Component 2 and 6 Project Areas will take place above the potentially jurisdictional culvert, outside of the banks of ES1, and will not involve the removal of any associated riparian trees or vegetation. The jurisdictional extents in relation to the Project Area are depicted in Attachment 1, Figure 5.

If it is determined during Project implementation that impacts will occur to the jurisdictional features (i.e., ES1, ES2, and their associated riparian habitat and culvert) mapped within the Study Area, consultation with the RWQCB and/or CDFW and the obtainment of a General Waste Discharge Requirements Permit for non-federal waters and/or a Streambed Alteration Agreement will be required.

Resources Protected by Local Policies and Ordinances

Protected Trees

Tree removal will not be conducted as a part of the Project; therefore, impacts to protected trees are not anticipated.

Habitat Conservation Plans

EMWD is not a Permittee under the MSHCP. The requirements of the MSHCP therefore do not directly apply to EMWD, meaning EMWD does not have to demonstrate consistency. However, pursuant to CEQA Guidelines Appendix G Checklist, Biological Resources criterion "f", EMWD cannot conflict with the MSHCP requirements. With implementation of the proposed mitigation measures, the Project would not conflict with any of the MSHCP requirements.

The Study Area is also within the Stephen’s Kangaroo Rat Mitigation Fee area. However, EMWD is not a signatory to the SKR HCP and payment of such fees is not prescriptive. Further, the project is not expected to result in impacts to Stephens’ kangaroo rat due to a lack of suitable habitat. The site is too rocky and mountainous to support the species. Therefore, the project would not conflict with the SKR HCP.

6 Avoidance and Minimization Measures

The below AMMs can be incorporated into the Project design to the maximum extent feasible to avoid and minimize impacts to special status species and other sensitive biological resources.

BIO-1: Special-Status and Quino Checkerspot Butterfly Host Plant Surveys

Focused special-status plant surveys shall be conducted to verify the presence or absence, estimate the abundance, and map the extent of the six special-status plant species that are present or have a high or moderate potential to occur within the Component 1 and 6 Project Areas and the northern staging area. The special-status plant survey should also involve a search for the host plants of QCB. The results of the survey will be used to determine if the Project has the potential to impact these special-status plant species and/or QCB. The surveys should be conducted within the plants' most distinct phenology period to correctly identify the species and in accordance with guidelines published by the USFWS (2000), CDFW (2018), and CNPS (2001). This window is typically during the flowering phase. Based on the phenology of the six species with a potential to occur (chaparral sand-verbena, Jaeger's milk-vetch, Parry's spineflower, white-bracted spineflower, Mojave tarplant, and slender-horned spineflower) and the QCB host plants (California plantain, wooly plantain, and owl's clover), the surveys shall be conducted in April and June.

If special-status plant species or QCB host plants are detected within the Project Area, the limits of their distribution shall be flagged. Flagging shall extend to the further extent within the Project Area, but outside any private property. Special-status plant species and QCB host plants shall be monitored for avoidance in accordance with avoidance and minimization measure BIO-4 to the maximum extent feasible. Impacts to special-status plant species and their occupied habitat that cannot be feasibly avoided will be minimized by salvaging the top eight inches of their occupied habitats topsoil. Salvaged topsoil will be spread at the same location following construction within temporarily impacted areas or to suitable habitat on-site for areas with permanent impacts. All topsoil salvaging and spreading operations will be overseen by a qualified botanist or restoration ecologist. If the avoidance of impacts to QCB host plants is not feasible, AMM BIO-7 shall be implemented to determine the presence of this species.

BIO-2: Worker Environmental Awareness Training

Prior to the initiation of the Project, an approved biologist shall present a Worker Environmental Awareness Training (WEAT) to all on-site personnel. The WEAT will educate the personnel on the identification of special-status species and regulated biological resources that are present or have the potential to occur within the Project Area, will cover the applicable regulatory policies and provisions regarding their protection, and will provide an overview of the Project's AMMs. Furthermore, on-site personnel will be briefed on the reporting process if an inadvertent injury or mortality should occur to a special-status species during construction.

BIO-3: Invasive Plant Species Control

Invasive plant species, for the purpose of this document, shall include all species with a California Invasive Plant Council (Cal-IPC) rating of limited, moderate, or high. Construction personnel and equipment shall be free of invasive plant seeds, propagules, and any material which may contain them (e.g., soil) prior to entering the Project Area. All potentially contaminated equipment will be carefully cleaned prior to the initiation of Project activities. Staging areas and temporary Project Areas shall avoid weed infestations and infestations within the Project Area(s) shall be flagged and avoided to the maximum extent feasible. Only certified weed-free materials (e.g., gravel, straw, and fill) shall be used for the Project.

BIO-4: Biological Monitoring

A qualified biologist shall be on site if special-status plant species, Crotch bumble bee nest(s), and/or occupied QCB habitat/host plants are determined to be present within 50 feet of the Project Area and can be avoided. The biologist shall be on site during all vegetation removal or grading activities within 50 feet of these regulated biological resources. The biologist will oversee and provide recommendations to facilitate avoidance of these regulated biological resources and will have the authority to temporarily halt work to protect them.

BIO-5: General Best Management Practices

General requirements that shall be followed by construction personnel are listed below.

- The contractor shall clearly delineate the Project limits, staging areas, and access points and prohibit any construction-related traffic outside of these boundaries.
- All food-related trash items, such as wrappers, cans, bottles, and food scraps generated during proposed Project construction, shall be disposed of in closed containers only and removed from the workspace.
- Best management practices (BMPs) shall be implemented throughout the Project and shall include, but not be limited to, erosion and sediment controls to minimize erosion during construction. BMPs shall be implemented for the duration of the Project until disturbed areas have been stabilized by long-term erosion control measures.
- Materials shall be stored at least 50 feet from streams and wetlands, as feasible, or equipment will utilize secondary containment.
- Construction materials and spoils shall be protected from stormwater runoff using temporary perimeter sediment barriers such as berms, silt fences, fiber rolls, covers, sand/gravel bags, and straw bale barriers, as appropriate.
- Vegetation trimming shall be limited to the maximum extent feasible.
- Any substances that could be hazardous to wildlife resulting from Project-related activities shall be prevented from contaminating the soil and/or entering waterways.
- Construction shall only take place during daylight hours.

BIO-6: Focused Crotch Bumble Bee Surveys

Focused Crotch bumble bee surveys shall be conducted within the Component 1 and 6 Project Areas and the northern staging area per the *Survey Considerations for CESA Candidate Bumble Bee Species* (CDFW 2023d). Foraging bumble bee surveys shall be conducted during this species' flight season (i.e., typically between May to September) to determine the presence or absence of this species within the Project Area. If this species is detected foraging within or adjacent to the Project Area, nesting surveys shall be conducted to identify active colonies. If an active colony is observed within the Project Area (to the further extent of the Project Area but outside any private property), the nest shall be relocated to suitable habitat outside of the Project Area. If an active nest is observed within the Project Area, the nest shall be monitored by a qualified biologist in accordance with AMM BIO-4. Alternatively, Project activities within the Project Area where an active nest is observed can be postponed until the nest is no longer in use.

BIO-7: Focused QCB Surveys

If detected and avoidance of QCB host plants is not feasible (as specified in AMM BIO-1), focused QCB surveys shall be conducted prior to project initiation to determine the presence or absence of this species in all areas QCB host plants are detected. The surveys shall be conducted in accordance with the *Survey Guidelines for Quino Checkerspot Butterfly* (USFWS 2014). The guidelines state that the surveys shall be conducted weekly by a Section 10(A)(1)(a) recovery permit holder and shall begin on the third week of February and end the second Saturday in May, unless an individual of the species is detected during any survey within the first five weeks.

If QCB host plants are present within the project site and QCB presence is confirmed during the focused surveys, suitable QCB habitat should be avoided. If avoidance is not feasible, consultation with the USFWS shall occur regarding 'take' of occupied QCB habitat. Host plants shall be relocated to suitable habitat outside of the Project Area by a qualified biologist prior to the commencement of construction.

BIO-8: Coastal California Gnatcatcher Avoidance and Minimization

Measures required during Project construction to avoid and/or minimize impacts to coastal California gnatcatcher include:

- All brushing, grading, or excavation (i.e., within the Component 1 and 6 Project Areas and the northern staging area) taking place adjacent to occupied habitat of the coastal California gnatcatcher (defined as within 500 feet of any gnatcatcher sightings [USFWS 2007]) shall be conducted from September 1 through February 14, which is outside the coastal California gnatcatcher breeding season.
- When conducting any other construction activities during the coastal California gnatcatcher breeding season of February 15 through August 30, adjacent to habitat in which coastal California gnatcatcher are known to occur or have potential to occur (within 500 feet of suitable scrub habitat), the following avoidance measures shall apply:
  - A USFWS-permitted biologist shall survey for coastal California gnatcatcher within 10 calendar days prior to initiating activities in an area. If coastal California gnatcatcher are present, but not nesting, a USFWS permittee biologist shall survey for nesting coastal California gnatcatcher approximately once per week within 500 feet of the construction area, where accessible, for the duration of the activity in that area during the breeding season. The standard California gnatcatcher survey protocol shall be followed for all surveys.
  - If an active nest is located, a 500-foot no-construction buffer shall be established around each nest site; however, there may be a reduction of this buffer zone depending on site-specific conditions such as topography, line-of-sight to the nest, or the existing ambient

level of activity at the discretion of the qualified biologist. No construction shall take place within this buffer until the nest is no longer active.

BIO-9: Pre-construction Nesting Bird Surveys

To avoid disturbance of nesting birds, including special-status species and birds protected by the MBTA and CFGC Section 3503, Project activities shall occur outside of the breeding season for nesting birds (generally February 1 through August 31), if feasible.

If construction occurs during the breeding season, then a pre-construction nesting bird survey shall be conducted no more than seven days prior to the initiation of Project activities. The nesting bird survey shall be conducted on foot inside the Project Area and include a 500-foot buffer for raptors and special-status species a 100-foot buffer for all other species. The survey shall be conducted by a biologist familiar with avian species known to inhabit Southern California. If nests are found, an avoidance buffer of up to 500 feet for raptors and special-status species and up to 100 feet for non-raptors (dependent upon the species, the proposed work activity, and existing disturbances associated with land use outside of the workspace) shall be determined and demarcated by the biologist with construction fencing, flagging, or other means to mark the boundary. Intrusion into the buffer may be conducted if it is determined by the biologist that there is no risk of harm to the nest and work is monitored by the biologist. If the risk of nest abandonment is observed, all construction activities within the buffer shall cease until the nest is no longer active as determined by the biologist.

7 Limitations

This BRA has been conducted in accordance with professionally accepted biological investigation practices conducted at this time and in this geographic area. The biological investigation is limited by the scope of work performed. Reconnaissance biological surveys for certain taxa may have been conducted as part of this assessment but were not performed during a particular blooming period, nesting period, or particular portion of the season when positive identification would be expected if present, and therefore, cannot be considered definitive. The biological surveys are limited also by the environmental conditions present at the time of the surveys. In addition, general biological (or protocol) surveys do not guarantee that the organisms are not present and will not be discovered in the future within the site. In particular, mobile wildlife species could occupy the site on a transient basis or re-establish populations in the future. Our field studies were based on current industry practices, which change over time and may not be applicable in the future. No other guarantees or warranties, expressed or implied, are provided. The findings and opinions conveyed in this report are based on findings derived from site reconnaissance, jurisdictional areas, review of CNDDB RareFind5, and specified historical and literature sources (CDFW 2023a). Standard data sources relied upon during the completion of this report, such as the CNDDB, may vary with regard to accuracy and completeness. In particular, the CNDDB is compiled from research and observations reported to CDFW that may or may not have been the result of comprehensive or site-specific field surveys. Although Rincon believes the data sources are reasonably reliable, Rincon cannot and does not guarantee the authenticity or reliability of the data sources it has used. Additionally, pursuant to our contract, the data sources reviewed included only those that are practically reviewable without the need for extraordinary research and analysis.

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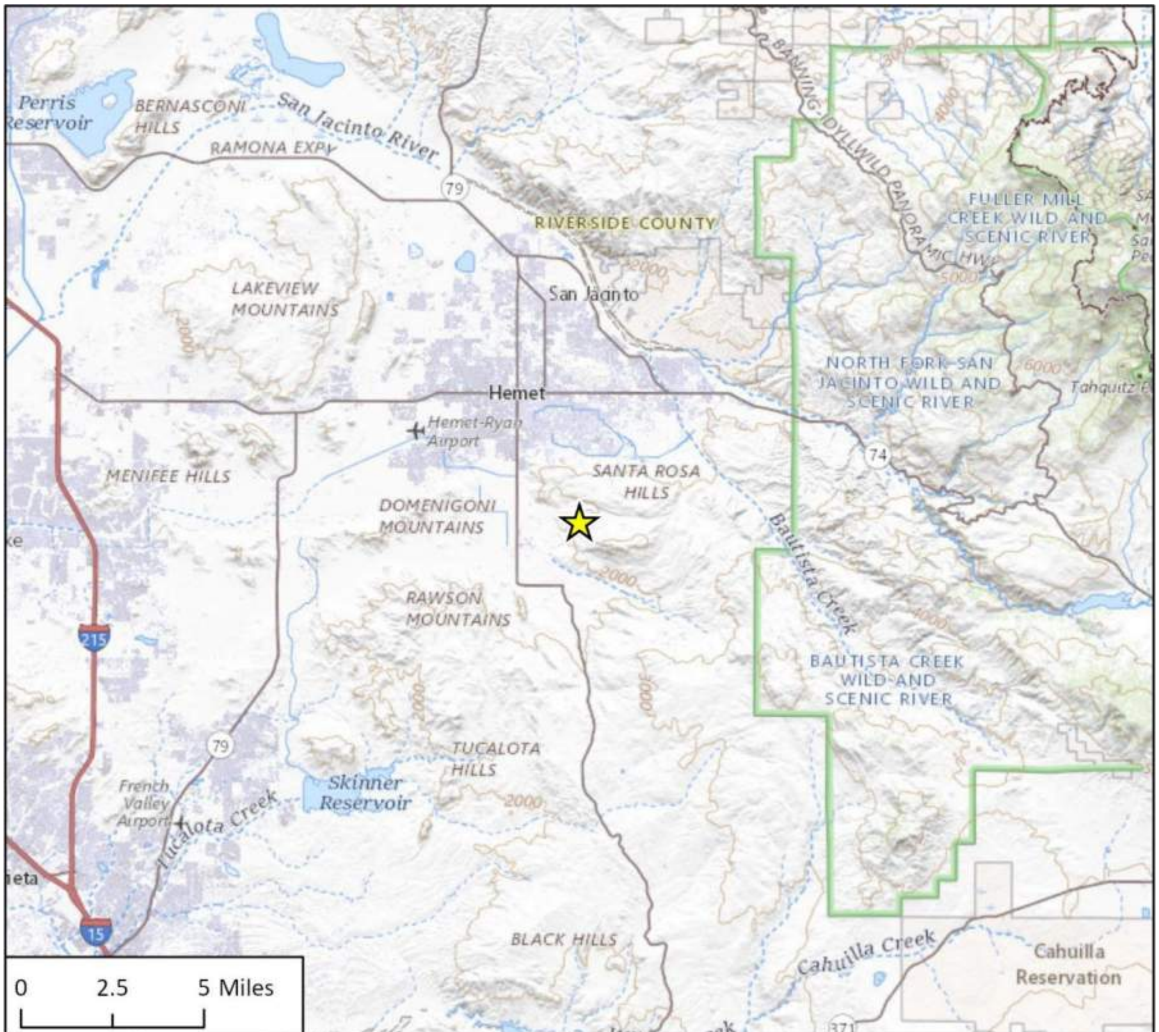
Attachment 1

Figures

Figure 1 Regional Location



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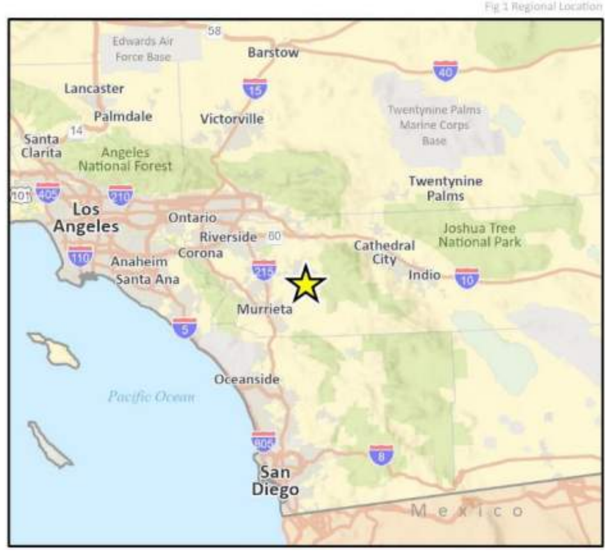

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Figure 2 Project Location

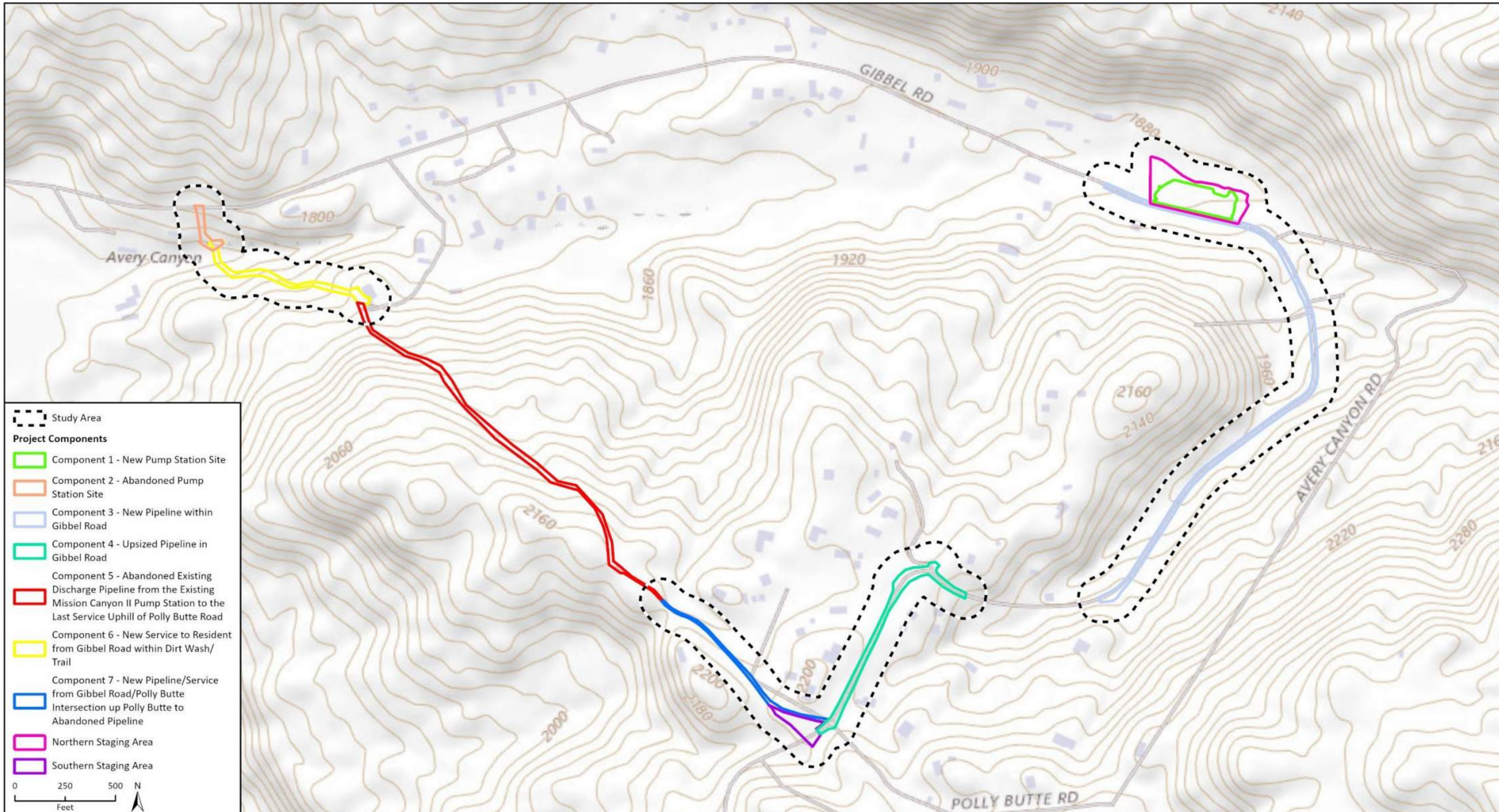

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Figure 3a Soils Map

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Additional data provided by Natural Resource Conservation Service Soil Survey Geography, 2023.

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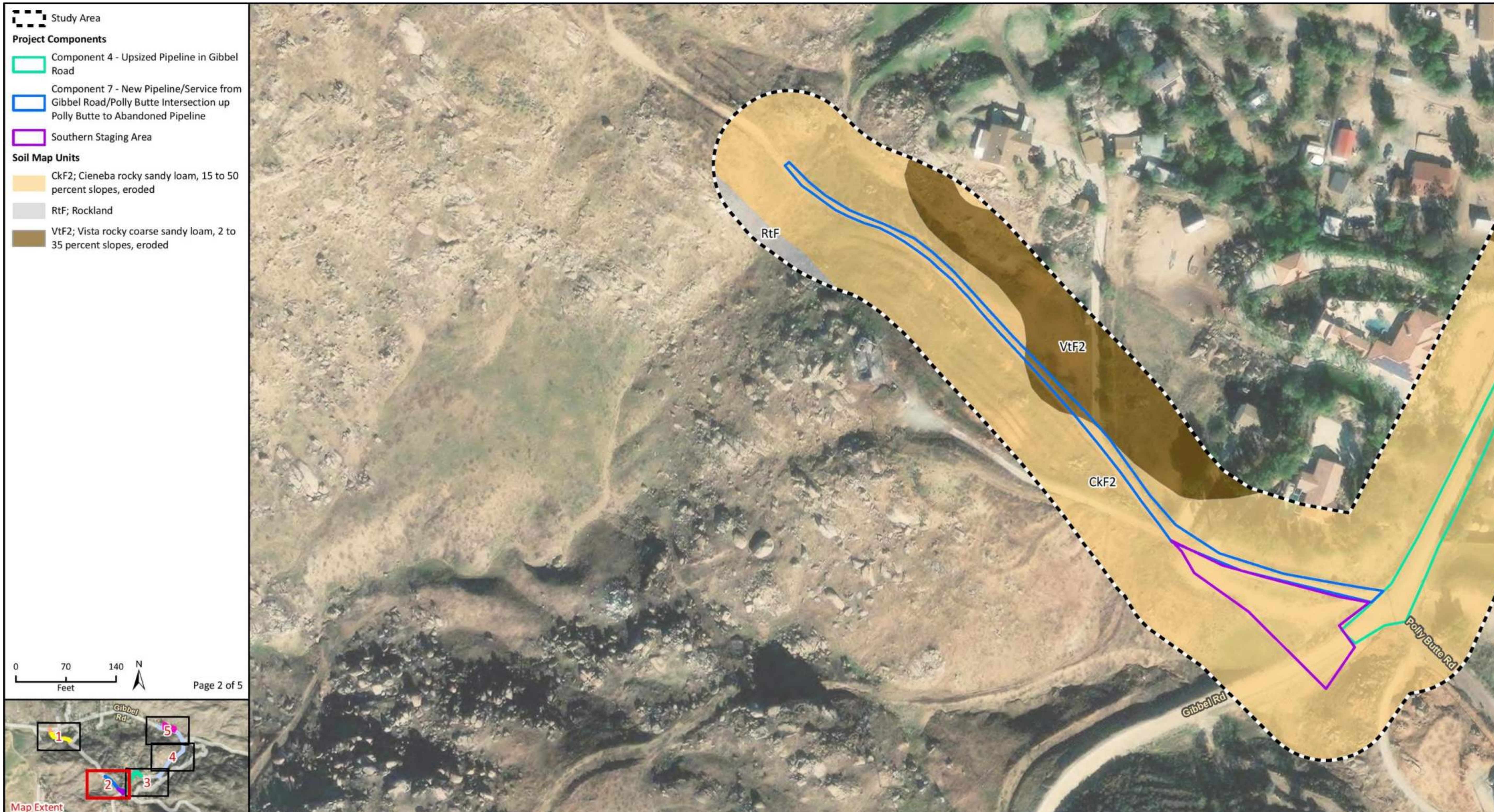
Fig 3 USGS NRCS Soils Map

Figure 3b Soils Map



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Additional data provided by Natural Resource Conservation Service Soil Survey Geography, 2023.

Figure 3c Soils Map

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Figure 3d Soils Map

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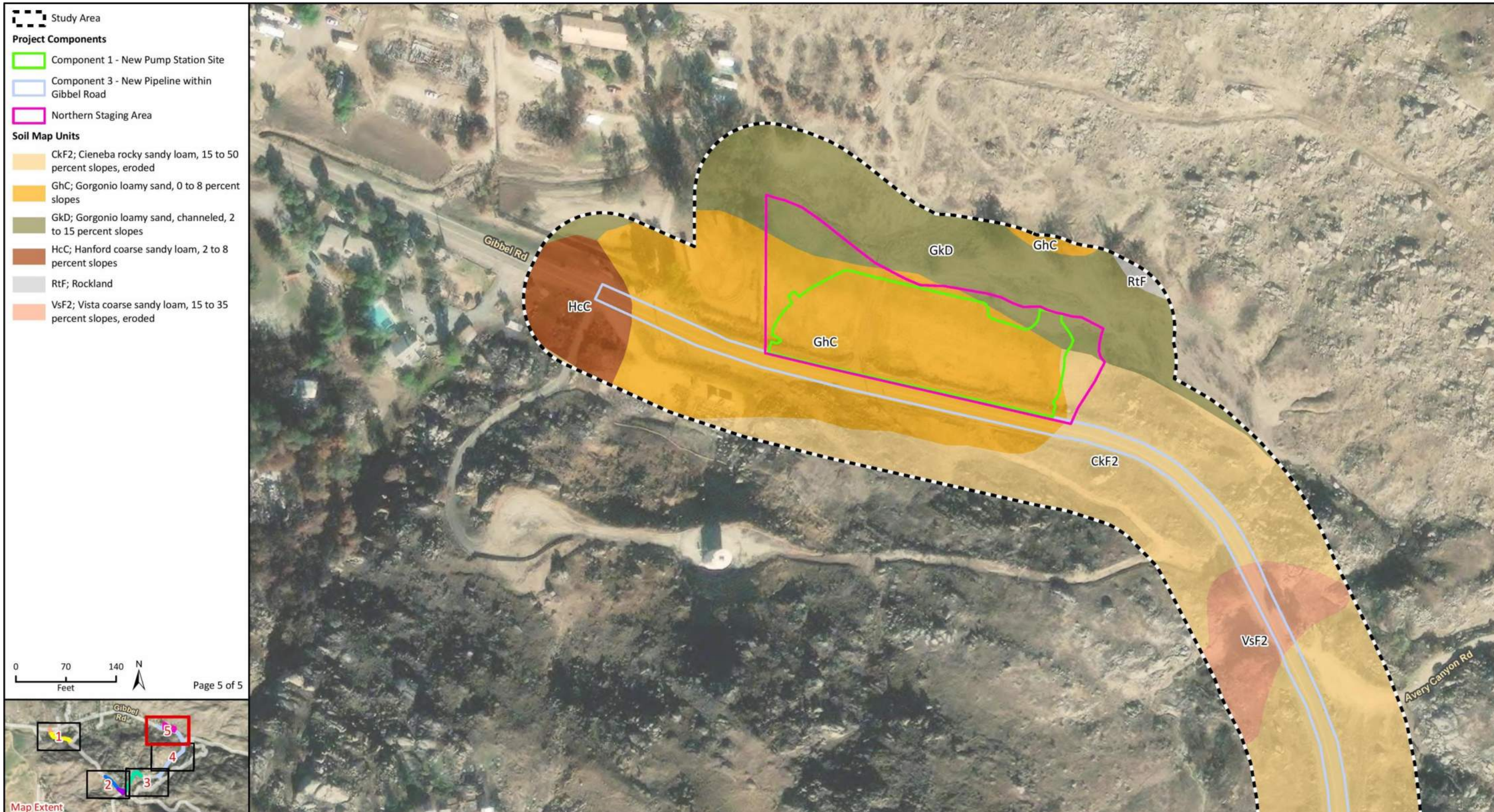
Additional data provided by Natural Resource Conservation Service Soil Survey Geography, 2023.

Figure 3e Soils Map



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Additional data provided by Natural Resource Conservation Service Soil Survey Geography, 2023.

Figure 4a Vegetation Communitites and Land Cover Types

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Figure 4b Vegetation Communities and Land Cover Types

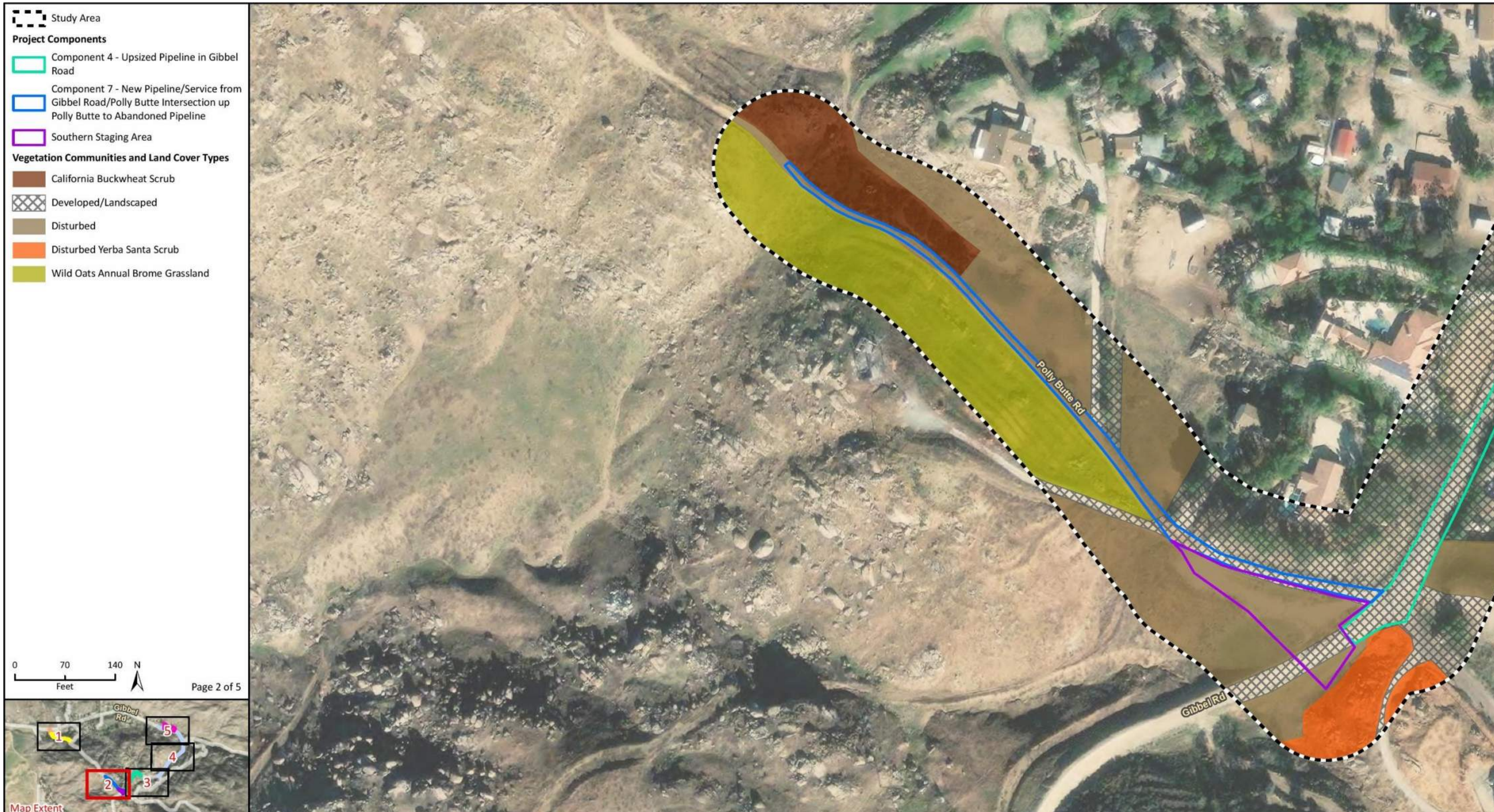

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Figure 4c Vegetation Communities and Land Cover Types

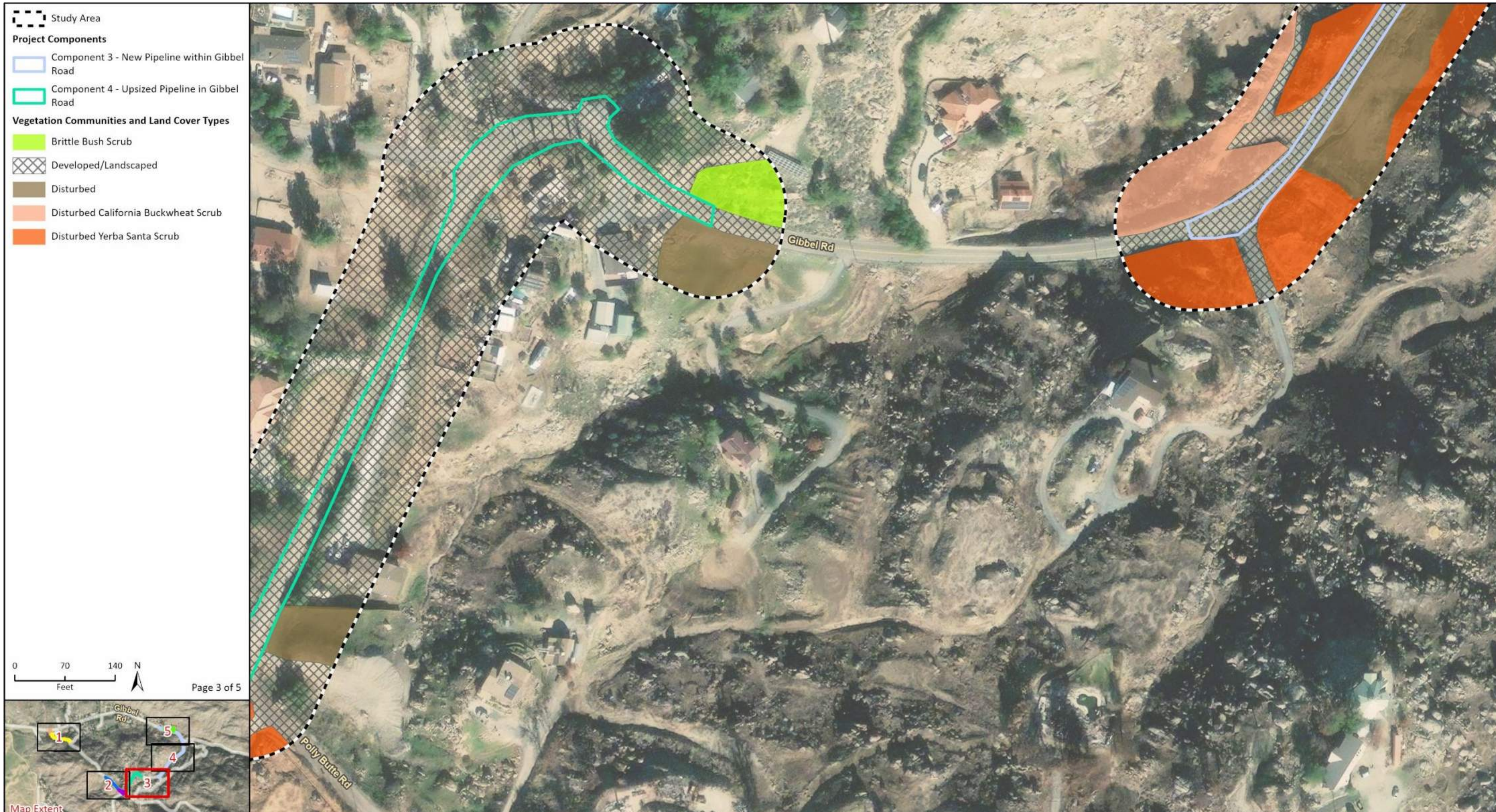

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Figure 4d Vegetation Communities and Land Cover Types

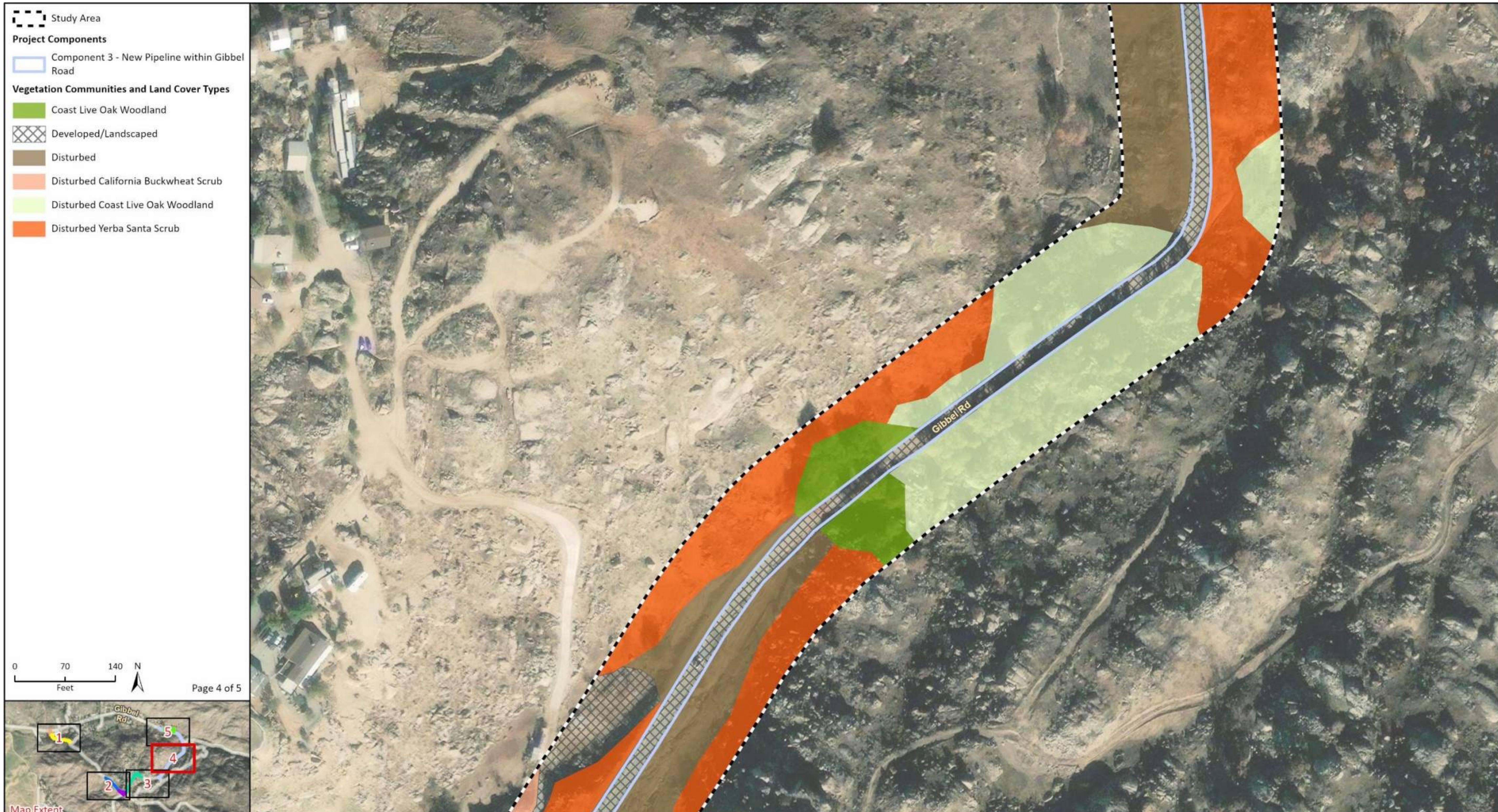

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Figure 4e Vegetation Communities and Land Cover Types

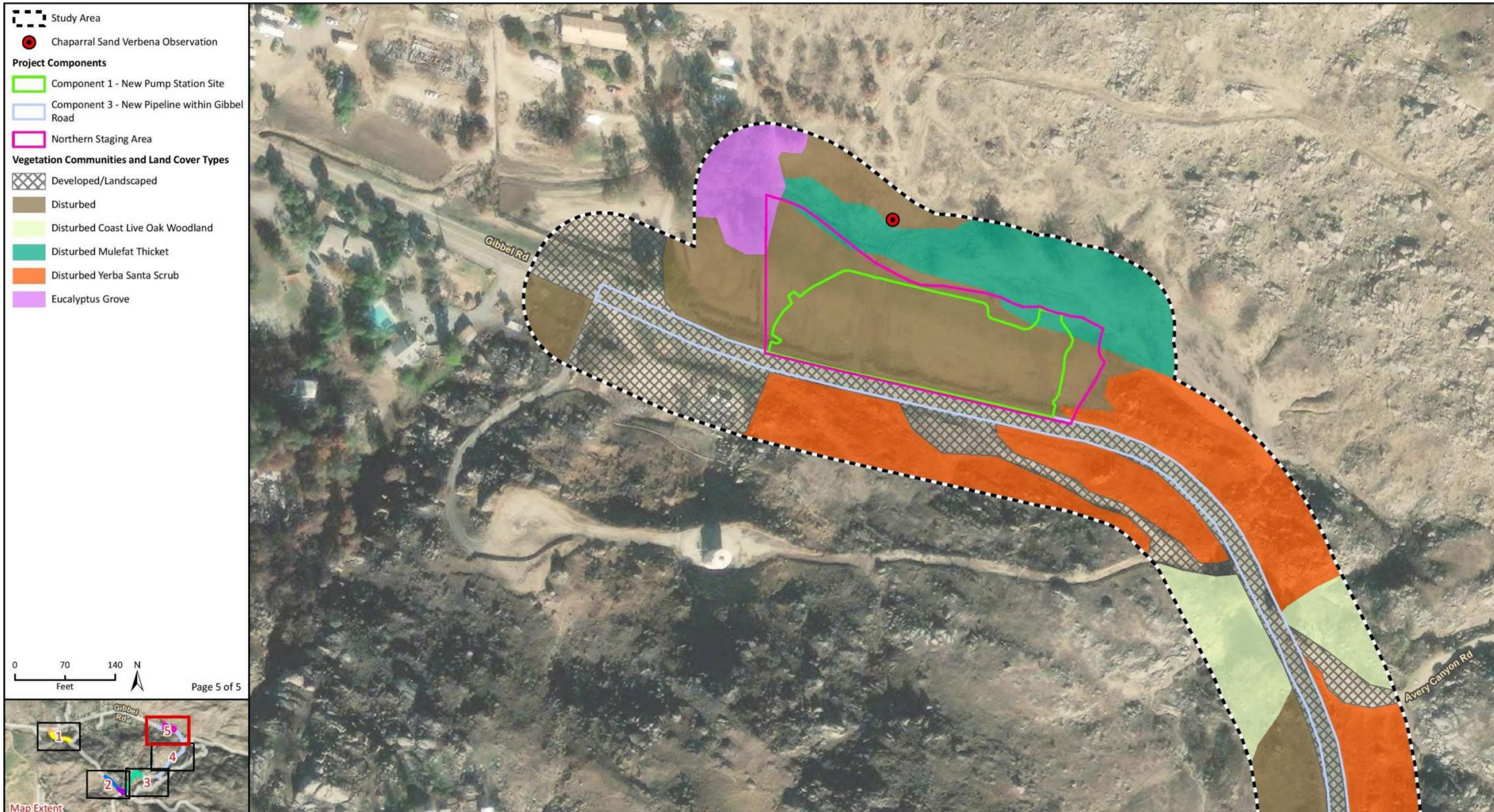

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Figure 5a Jurisdictional Resources

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1. Additional National Hydrology Dataset data provided by the U.S. Geological Survey.

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Fig 5 Jurisdictional Resources

Figure 5b Jurisdictional Resources

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1. Additional National Hydrology Dataset data provided by the U.S. Geological Survey.

Figure 5c Jurisdictional Resources

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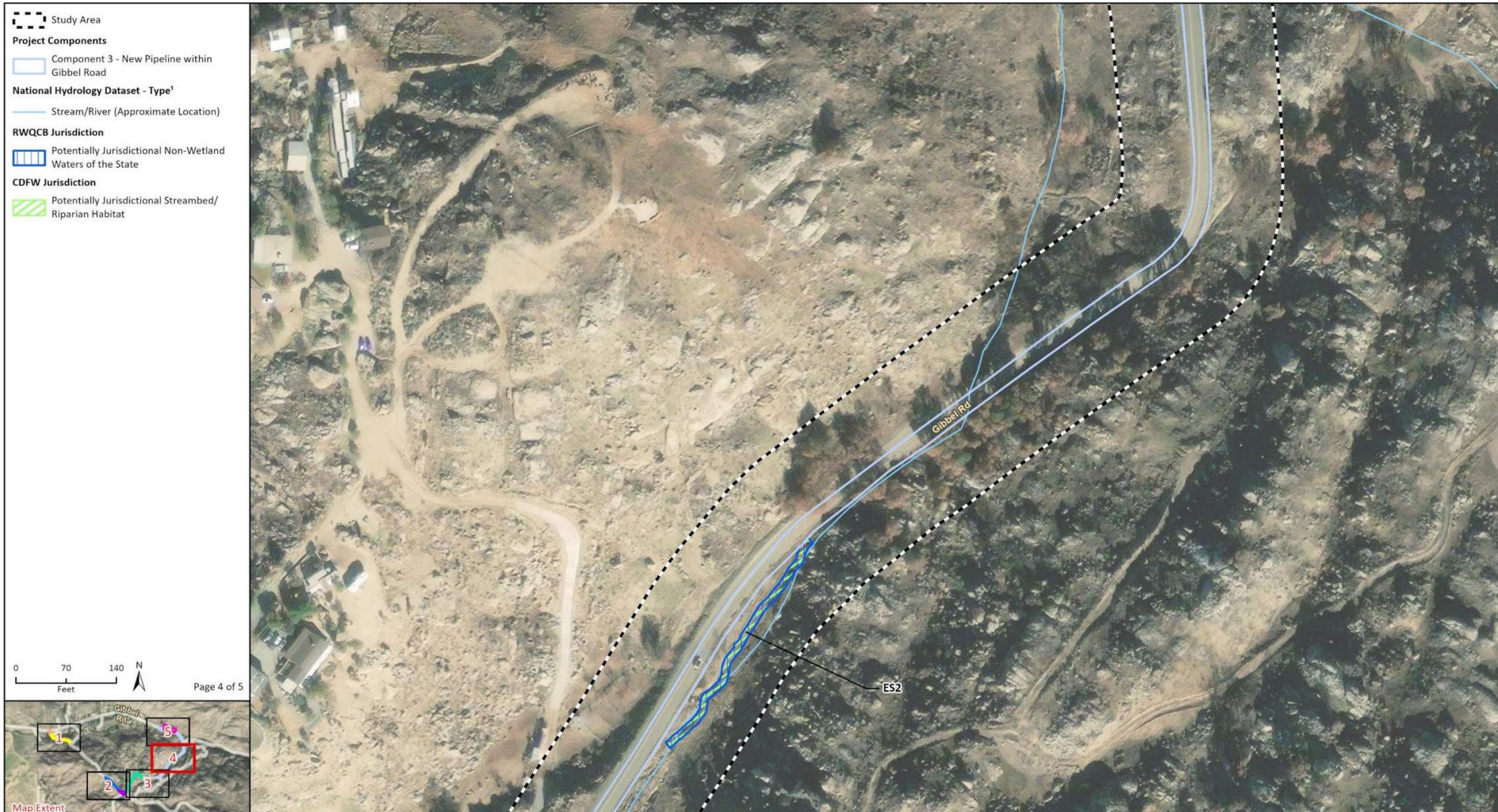
1. Additional National Hydrology Dataset data provided by the U.S. Geological Survey.

Figure 5d Jurisdictional Resources



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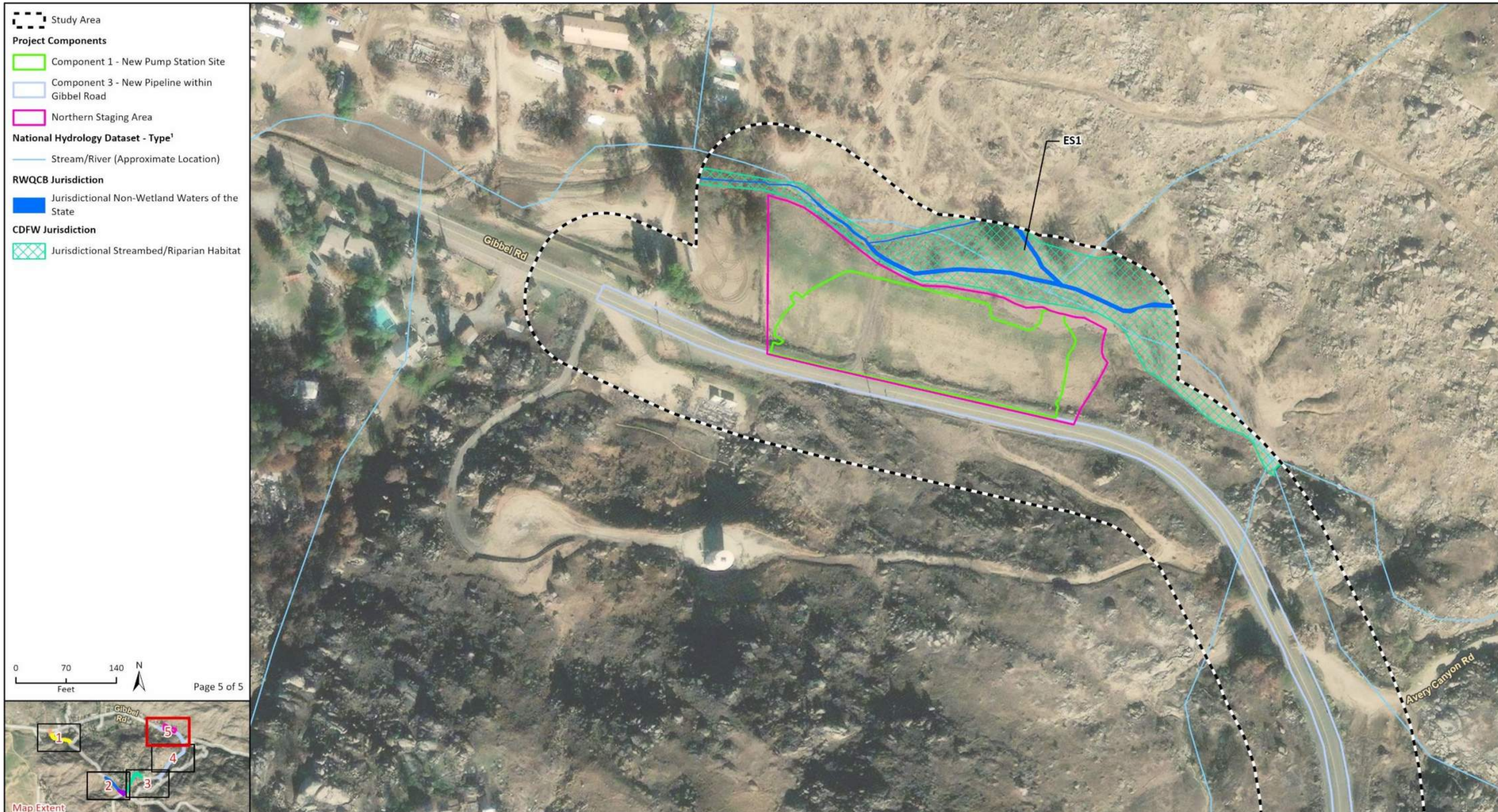
1. Additional National Hydrology Dataset data provided by the U.S. Geological Survey.

Figure 5e Jurisdictional Resources



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1. Additional National Hydrology Dataset data provided by the U.S. Geological Survey.

Attachment 2

Site Photographs

Site Photographs

Photograph 1. North-facing representative photograph of brittle bush scrub, taken within the northeastern Component 4 Study Area.

Photograph 2. Southeast-facing representative photograph of California buckwheat scrub, taken within the Component 6 Study Area.

Photograph 3. West-facing representative photograph of California sycamore – coast live oak riparian woodland, taken within the western Component 2 Study Area.

Photograph 4. Northwest-facing representative photograph of disturbed California sycamore – coast live oak riparian woodland (indicated by yellow arrow), taken within the Component 6 Study Area.

Photograph 5. North-facing representative photograph of coast live oak woodland, taken within the Component 3 Study Area.

Photograph 6. North-facing representative photograph of disturbed coast live oak woodland, taken within the Component 3 Study Area.

Photograph 7. North-facing representative photograph of the developed/landscaped land cover type, taken within the Component 4 Study Area.

Photograph 8. West-facing representative photograph of the disturbed land cover type, taken within the Component 1 Study Area.

Photograph 9. West-facing representative photograph of the eucalyptus grove (indicated by yellow arrow), taken within the Component 1 Study Area

Photograph 10. East-facing representative photograph of the disturbed mulefat thicket, taken within the Component 1 Study Area.

Photograph 11. Southeast-facing representative photograph of wild oats and annual brome grassland, taken within the Component 7 Study Area.

Photograph 12. South-facing representative photograph of the disturbed yerba santa scrub, taken within the Component 6 Study Area.

Photograph 13. West-facing representative photograph of ES1, taken within the northern Component 3 Study Area.

Photograph 14. North-facing representative photograph of ES2, taken within the Component 3 Study Area.

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Attachment 3

Species Compendium

Plant and Wildlife Species Detected in the Study Area on September 21, 2023

Scientific Name[1]	Common Name	Status[2]	Native or Introduced
Plants			
Abronia villosa var. *aurita*	Chaparral sand-verbena	CRPR 1B.1	Native
Acmispon glaber	Deerweed	N/A	Native
Amaranthus albus	Tumbleweed	N/A	Introduced
Amaranthus palmeri	Palmer’s amaranth	N/A	Native
Ambrosia psilostachya	Western ragweed	N/A	Native
Argemone munita	Prickly poppy	N/A	Native
Artemisia californica	California sage	N/A	Native
Artemisia douglasiana	California mugwart	N/A	Native
Avena spp.	Wild oats	Cal-IPC Moderate	Introduced
Baccharis salicifolia	Mulefat	N/A	Native
Brassica tournefortii	Saharan mustard	Cal-IPC High	Introduced
Brickellia californica	California bricklebush	N/A	Native
Bromus diandrus	Ripgut brome	Cal-IPC Moderate	Introduced
Bromus madritensis ssp. *rubens*	Red brome	Cal-IPC High	Introduced
Bromus tectorum	Cheatgrass	Cal-IPC High	Native
Calystegia occidentalis	Chaparral false bindweed	N/A	Native
Centaurea melitensis	Tocalote	Cal-IPC Moderate	Introduced
Chenopodium album	Lamb’s quarters	N/A	Introduced
Corethrogyne filaginifolia	Common sandaster	N/A	Native
Croton californicus	California croton	N/A	Native
Croton setiger	Doveweed	N/A	Native
Cucurbita palmata	Coyote melon	N/A	Native
Cynodon dactylon	Bermuda grass	Cal-IPC Moderate	Introduced
Cyperus eragrostis	Tall flatsedge	N/A	Native
Dactyloctenium aegyptium	Crows foot grass	N/A	Introduced
Datura wrightii	Sacred datura	N/A	Native
Deinandra fasciculata	Clustered tarweed	N/A	Native
Elymus condensatus	Giant wild rye	N/A	Native
Encelia farinosa	Brittlebush	N/A	Native
Erigeron canadensis	Canada horseweed	N/A	Native
Eriodictyon crassifolium	Tickleaf yerba santa	N/A	Native
Eriogonum fasciculatum	California buckwheat	N/A	Native
Eriogonum gracile	Slender buckwheat	N/A	Native
Eriophyllum confertiflorum	Golden yarrow	N/A	Native
Erodium sp.	Erodium	N/A	Introduced
Erythranthe cardinalis	Cardinal monkey flower	N/A	Native
Eucalyptus camaldulensis	Red gum	Cal-IPC Limited	Introduced
Festuca myuros	Rattail fescue	Cal-IPC Moderate	Introduced

Scientific Name[1]	Common Name	Status[2]	Native or Introduced
Helianthus annuus	Common sunflower	N/A	Native
Heliotropium curassavicum	Seaside heliotrope	N/A	Native
Hesperoyucca whipplei	Chapparal yucca	N/A	Native
Heterotheca grandiflora	Telegraph weed	N/A	Native
Hirschfeldia incana	Short-pod mustard	Cal-IPC Moderate	Introduced
Jacaranda mimosifolia	Jacaranda	N/A	Introduced
Leptochloa fusca	Sprangletop	N/A	Native
Malacothamnus fasciculatus	Chaparral bush mallow	N/A	Native
Malva parviflora	Cheesweed	N/A	Introduced
Medicago polymorpha	Bur medic	Cal-IPC Limited	Introduced
Medicago sativa	Alfalfa	N/A	Native
Nerium oleander	Oleander	N/A	Introduced
Nicotiana attenuata	Coyote tobacco	N/A	Native
Nicotiana glauca	Tree tobacco	Cal-IPC Moderate	Introduced
Nuttallanthus texanus	Blue toadflax	N/A	Native
Olea europaea	European olive	Cal-IPC Limited	Introduced
Oncosiphon pilulifer	Stinknet	Cal-IPC High	Introduced
Penstemon centranthifolius	Scarlet bugler	N/A	Native
Phacelia ramosissma	Branching phacelia	N/A	Native
Pinus halepensis	Aleppo pine	N/A	Introduced
Platanus racemosa	California sycamore	N/A	Native
Populus fremontii	Freemont cottonwood	N/A	Native
Prunus ilicifolia	Holly leaf cherry	N/A	Native
Quercus agrifolia	Coast live oak	N/A	Native
Rumex crispus	Curley dock	Cal-IPC Limited	Introduced
Rumex salicifolius	Willow leaved dock	N/A	Native
Salix laevigata	Red willow	N/A	Native
Salsola tragus	Russian thistle	Cal-IPC Limited	Introduced
Salvia columbariae	Chia	N/A	Native
Salvia mellifera	Black sage	N/A	Native
Sambucus mexicana	Blue elderberry	N/A	Native
Schinus molle	Peruvian peppertree	Cal-IPC Limited	Introduced
Schismusa barbatus	Common Mediterranean Grass	Cal-IPC Limited	Introduced
Stachys ajugoides	Hedge nettle	N/A	Native
Stephanomeria exigua	Small wire lettuce	N/A	Native
Typha sp.	Cattail	N/A	Native
Washingtonia robusta	Mexican fan palm	Cal-IPC Moderate	Introduced

Scientific Name[1]	Common Name	Status[2]	Native or Introduced
Animals			
Birds			
Callipepla californica	California quail	N/A	Native
Calypte anna	Anna’s hummingbird	N/A	Native
Cathartes aura	Turkey vulture	N/A	Native
Columbia livia	Rock pigeon	N/A	Introduced
Haemorhous mexicanus	House finch	N/A	Native
Hirundo rustica	Barn swallow	N/A	Native
Melanerpes formicivorus	Acorn woodpecker	N/A	Native
Melozone crissalis	California towhee	N/A	Native
Mimus polyglottos	Northern mockingbird	N/A	native
Passer domesticus	House sparrow	N/A	Introduced
Piranga ludoviciana	Western tanager	N/A	Native
Salpinctes obsoletus	Rock wren	N/A	Native
Sayornis nigricans	Black phoebe	N/A	Native
Streptopelia decaocto	Eurasian collared-dove	N/A	Introduced
Tyrannus vociferans	Cassin’s kingbird	N/A	Native

[1] Jepson Flora Project 2023.

[2] CNPS 2023; Cal-IPC 2023.

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Attachment 4

Special-Status Species Potential to Occur

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Study Area	Habitat Suitability/Observations
Plants and Lichens				
Abronia villosa var. *aurita* chaparral sand-verbena	None/None G5T2?/S2 1B.1	Annual herb. Chaparral, coastal scrub, desert dunes. Sandy.Elevations: 245-5250ft. (75-1600m.) Blooms (Jan)Mar-Sep.	Present	This species was observed north of the wash in the pump station site area.
Allium marvinii Yucaipa onion	None/None G1/S1 1B.2	Perennial bulbiferous herb. Chaparral. In openings on clay soils. Elevations: 2495-3495ft. (760-1065m.) Blooms Apr-May.	No potential	No suitable soils are present within the Study Area. Study Area not within this species documented elevational range.
Allium munzii Munz's onion	FE/ST G1/S1 1B.1	Perennial bulbiferous herb. Chaparral, cismontane woodland, coastal scrub, pinyon and juniper woodland, valley and foothill grassland. Clay, mesic. Elevations: 975-3510ft. (297-1070m.) Blooms Mar-May.	No potential	No suitable soils are present within the Study Area.
Ambrosia pumila San Diego ambrosia	FE/None G1/S1 1B.1	Perennial rhizomatous herb. Chaparral, coastal scrub, valley and foothill grassland, vernal pools. Alkaline (sometimes), clay (sometimes), disturbed areas (often), sandy (sometimes). Elevations: 65-1360ft. (20-415m.) Blooms Apr-Oct.	No potential	Study Area is outside of this species documented geographic and elevational range and was not observed during the field survey, when it would have been identifiable.
Astragalus pachypus var. *jaegeri* Jaeger's milk-vetch	None/None G4T1/S1 1B.1	Perennial shrub. Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. Rocky (sometimes), sandy (sometimes). Elevations: 1200-3200ft. (365-975m.) Blooms Dec-Jun.	Moderate potential	Suitable rocky and sandy soils are present within the Study Area. However, this species was not observed during the field survey when it would have been identifiable, and the majority of the Study Area has burned recently and is in disturbed or within an early successional stage.
Atriplex coronata var. *notatior* San Jacinto Valley crownscale	FE/None G4T1/S1 1B.1	Annual herb. Playas, valley and foothill grassland, vernal pools. Alkaline. Elevations: 455-1640ft. (139-500m.) Blooms Apr-Aug.	No potential	No suitable habitat is present within the Study Area.
Atriplex parishii Parish's brittlescale	None/None G1G2/S1 1B.1	Annual herb. Chenopod scrub, playas, vernal pools. Alkaline. Elevations: 80-6235ft. (25-1900m.) Blooms Jun-Oct.	No potential	No suitable habitat is present within the Study Area.
Atriplex serenana var. *davidsonii* Davidson's saltscale	None/None G5T1/S1 1B.2	Annual herb. Coastal bluff scrub, coastal scrub. Alkaline. Elevations: 35-655ft. (10-200m.) Blooms Apr-Oct.	No potential	Alkaline soils are absent from the Study Area.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Study Area	Habitat Suitability/Observations
Berberis nevinii Nevin's barberry	FE/SE G1/S1 1B.1	Perennial evergreen shrub. Chaparral, cismontane woodland, coastal scrub, riparian scrub. Gravelly (sometimes), sandy (sometimes). Elevations: 230-2705ft. (70-825m.) Blooms (Feb)Mar-Jun.	No potential	The Study Area is outside of this species documented geographic range; this species was not observed during the field survey when it would have been identifiable; the Study Area is recovering from a fire and contains a moderate degree of disturbance.
Brodiaea filifolia thread-leaved brodiaea	FT/SE G2/S2 1B.1	Perennial bulbiferous herb. Chaparral, cismontane woodland, coastal scrub, playas, valley and foothill grassland, vernal pools. Clay (often). Elevations: 80-3675ft. (25-1120m.) Blooms Mar-Jun.	No potential	Suitable clay soils are absent from the Study Area along with this species preferred habitat type (vernal pools). The Study Area is also outside of this species documented geographic range.
Calochortus palmeri var. *munzii* San Jacinto mariposa-lily	None/None G3T3/S3 1B.2	Perennial bulbiferous herb. Chaparral, lower montane coniferous forest, meadows and seeps. Seen in open Jeffrey pine forest as well as in chaparral. Elevations: 2805-7220ft. (855-2200m.) Blooms Apr-Jul.	No potential	No suitable habitat is present within the Study Area. The Study Area is outside of this species documented geographic range.
Calochortus weedii var. *intermedius* intermediate mariposa-lily	None/None G3G4T3/S3 1B.2	Perennial bulbiferous herb. Chaparral, coastal scrub, valley and foothill grassland. Rocky. Elevations: 345-2805ft. (105-855m.) Blooms May-Jul.	Low potential	Coastal scrub and grassland are present within the Study Area; however, this species preferred habitat type of calcareous slopes and outcrops are absent from the Study Area.
Centromadia pungens ssp. *laevis* smooth tarplant	None/None G3G4T2/S2 1B.1	Annual herb. Chenopod scrub, meadows and seeps, playas, riparian woodland, valley and foothill grassland. Alkaline. Elevations: 0-2100ft. (0-640m.) Blooms Apr-Sep.	No potential	Suitable riparian woodland and grassland habitat is present within the Study Area. However, poorly drained alkaline soils are not present.
Chorizanthe parryi var. *parryi* Parry's spineflower	None/None G3T2/S2 1B.1	Annual herb. Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. Openings, Rocky (sometimes), sandy (sometimes). Elevations: 900-4005ft. (275-1220m.) Blooms Apr-Jun.	High potential	Suitable coastal scrub habitat with rocky and sandy openings are present within the Study Area. The Study Area is within this species documented geographic and elevational range and two occurrences have been documented less than 2 miles west of the Study Area.
Chorizanthe polygonoides var. *longispina* long-spined spineflower	None/None G5T3/S3 1B.2	Annual herb. Chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, vernal pools. Clay (often). Elevations: 100-5020ft. (30-1530m.) Blooms Apr-Jul.	Low potential	Suitable coastal scrub habitat is present within the Study Area. However, suitable gabbroic clay soils are absent from the Study Area.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Study Area	Habitat Suitability/Observations
Chorizanthe xanti var. leucotheca white-bracted spineflower	None/None G4T3/S3 1B.2	Annual herb. Coastal scrub, mojavean desert scrub, pinyon and juniper woodland. Gravelly (sometimes), sandy (sometimes). Elevations: 985-3935ft. (300-1200m.) Blooms Apr-Jun.	Moderate potential	One of this species preferred microhabitat types (alluvial fans within coastal scrub) is present within the Study Area along with gravelly and sandy soil. This species has been recently documented approximately 5 miles northwest of the Study Area off of Highway 74.
Cryptantha wigginsii Wiggins' cryptantha	None/None G2/S1 1B.2	Annual herb. Coastal scrub. Often on clay soils. Elevations: 65-900ft. (20-275m.) Blooms Feb-Jun.	No potential	Clay soils are absent from the Study Area. The Study Area is also well outside of this species documented elevational range.
Deinandra mohavensis Mojave tarplant	None/SE G3/S3 1B.3	Annual herb. Chaparral, coastal scrub, riparian scrub. Low sand bars in river bed; mostly in riparian areas or in ephemeral grassy areas. Elevations: 2100-5250ft. (640-1600m.) Blooms (Jan-May)Jun-Oct.	High potential	Suitable coastal scrub and riparian scrub habitat is present within the Study Area in addition to this species preferred microhabitat (i.e., low sandbars in stream beds and ephemeral grassy areas). Additionally, this species has been documented several times within 5 miles of the Study Area, with the closest observation less than 1 mile east of the Study Area and the Study Area is within this species documented elevational range.
Delphinium hesperium ssp. *cuyamacae* Cuyamaca larkspur	None/SR G4T2/S2 1B.2	Perennial herb. Lower montane coniferous forest, meadows and seeps, vernal pools. Usually found in low, moist areas within meadows. Elevations: 4005-5350ft. (1220-1631m.) Blooms May-Jul.	No potential	No suitable habitat is present within the Study Area and the Study Area is not within this species documented elevational range.
Dodecahema leptoceras slender-horned spineflower	FE/SE G1/S1 1B.1	Annual herb. Chaparral, cismontane woodland, coastal scrub. Flood deposited terraces and washes; associates include Encelia, Dalea, Lepidospartum, etc. Sandy soils. Elevations: 655-2495ft. (200-760m.) Blooms Apr-Jun.	Moderate potential	Suitable coastal scrub habitat with a flood deposited terrace and wash is present within the Study Area along with one of this species common associates (i.e., *Encelia farinosa)* and sandy soils. In addition, this species has been documented four separate times approximately 5 miles east of the Study Area and the Study Area is within this species known geographic range. However, the wash does contain a degree of disturbance from land management activities from the adjacent property owners.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Study Area	Habitat Suitability/Observations
Dudleya multicaulis many-stemmed dudleya	None/None G2/S2 1B.2	Perennial herb. Chaparral, coastal scrub, valley and foothill grassland. In heavy, often clayey soils or grassy slopes. Elevations: 50-2590ft. (15-790m.) Blooms Apr-Jul.	No potential	Suitable soils are absent from the Study Area.
Galium angustifolium ssp. *jacinticum* San Jacinto Mountains bedstraw	None/None G5T2?/S2? 1B.3	Perennial herb. Lower montane coniferous forest. Open mixed forest. Elevations: 4430-6890ft. (1350-2100m.) Blooms Jun-Aug.	No potential	No suitable habitat is present within the Study Area.
Galium californicum ssp. *primum* Alvin Meadow bedstraw	None/None G5T2/S2 1B.2	Perennial herb. Chaparral, lower montane coniferous forest. Grows in shade of trees and shrubs at the lower edge of the pine belt, in pine forest-chaparral ecotone. Granitic, sandy soils. Elevations: 4430-5580ft. (1350-1700m.) Blooms May-Jul.	No potential	No suitable habitat is present within the Study Area.
Imperata brevifolia California satintail	None/None G3/S3 2B.1	Perennial rhizomatous herb. Chaparral, coastal scrub, meadows and seeps, mojavean desert scrub, riparian scrub. Mesic sites, alkali seeps, riparian areas. 3-. Elevations: 0-3985ft. (0-1215m.) Blooms Sep-May.	Low potential	Coastal scrub habitat along with mesic sites and riparian scrub is present within the Study Area. However, the Study Area is generally outside of this species documented geographic range and this species was not documented during the field survey when it would have been identifiable.
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields	None/None G4T2/S2 1B.1	Annual herb. Marshes and swamps, playas, vernal pools. Usually found on alkaline soils in playas, sinks, and grasslands. 1-. Elevations: 5-4005ft. (1-1220m.) Blooms Feb-Jun.	No potential	No suitable habitat is present within the Study Area.
Lilium parryi lemon lily	None/None G3/S3 1B.2	Perennial bulbiferous herb. Lower montane coniferous forest, meadows and seeps, riparian forest, upper montane coniferous forest. Wet, mountainous terrain; generally in forested areas; on shady edges of streams, in open boggy meadows and seeps. Elevations: 4005-9005ft. (1220-2745m.) Blooms Jul-Aug.	No potential	No suitable habitat is present within the Study Area.
Monardella macrantha ssp. *hallii* Hall's monardella	None/None G5T3/S3 1B.3	Perennial rhizomatous herb. Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Dry slopes and ridges in openings. Elevations: 2395-7200ft. (730-2195m.) Blooms Jun-Oct.	No potential	No suitable habitat is present within the Study Area.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Study Area	Habitat Suitability/Observations
Monardella nana ssp. *leptosiphon* San Felipe monardella	None/None G4G5T2Q/S2 1B.2	Perennial rhizomatous herb. Chaparral, lower montane coniferous forest. Sometimes in openings and fuelbreaks or in the understory of forest or chaparral. Elevations: 3935-6085ft. (1200-1855m.) Blooms Jun-Jul.	No potential	No suitable habitat is present within the Study Area.
Nama stenocarpa mud nama	None/None G4G5/S1S2 2B.2	Annual/perennial herb. Marshes and swamps. Lake shores, river banks, intermittently wet areas. Elevations: 15-1640ft. (5-500m.) Blooms Jan-Jul.	Low potential	Streambanks are present within the Study Area; however, this species preferred habitat type is not. Additionally, the Study Area is outside of this species documented geographic and elevational range.
Navarretia fossalis spreading navarretia	FT/None G2/S2 1B.1	Annual herb. Chenopod scrub, marshes and swamps, playas, vernal pools. San Diego hardpan and San Diego claypan vernal pools; in swales and vernal pools, often surrouded by other habitat types. Elevations: 100-2150ft. (30-655m.) Blooms Apr-Jun.	No potential	No suitable habitat is present within the Study Area.
Orcuttia californica California Orcutt grass	FE/SE G1/S1 1B.1	Annual herb. Vernal pools. Elevations: 50-2165ft. (15-660m.) Blooms Apr-Aug.	No potential	No suitable habitat is present within the Study Area.
Penstemon californicus California beardtongue	None/None G3/S2 1B.2	Perennial herb. Chaparral, lower montane coniferous forest, pinyon and juniper woodland. Stony slopes and shrubby openings; sandy or granitic soils. Elevations: 3840-7545ft. (1170-2300m.) Blooms May-Jun(Aug).	No potential	No suitable habitat is present within the Study Area.
Petalonyx linearis narrow-leaf sandpaper-plant	None/None G4/S3? 2B.3	Perennial shrub. Mojavean desert scrub, sonoran desert scrub. Sandy or rocky canyons. Elevations: -80-3660ft. (-25-1115m.) Blooms (Jan-Feb)Mar-May(Jun-Dec).	No potential	No suitable habitat is present within the Study Area.
Pseudognaphalium leucocephalum white rabbit-tobacco	None/None G4/S2 2B.2	Perennial herb. Chaparral, cismontane woodland, coastal scrub, riparian woodland. Sandy, gravelly sites. Elevations: 0-6890ft. (0-2100m.) Blooms (Jul)Aug-Nov(Dec).	Low potential	Suitable coastal scrub habitat and sandy/gravelly soils are present within the Study Area. However, the Study Area is outside of this species documented geographic range and this species was not observed during the field survey when it would have been identifiable.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Study Area	Habitat Suitability/Observations
Saltugilia latimeri Latimer's woodland-gilia	None/None G3/S3 1B.2	Annual herb. Chaparral, mojavean desert scrub, pinyon and juniper woodland. Rocky or sandy substrate; sometimes in washes, sometimes limestone. Elevations: 1310-6235ft. (400-1900m.) Blooms Mar-Jun.	Low potential	Rocky and sandy substrates are present within the Study Area along with a wash. However, this species preferred habitat type is absent and the Study Area is outside of this species documented geographic range.
Scutellaria bolanderi ssp. *austromontana* southern mountains skullcap	None/None G4T3/S3 1B.2	Perennial rhizomatous herb. Chaparral, cismontane woodland, lower montane coniferous forest. In gravelly soils on streambanks or in mesic sites in oak or pine woodland. Elevations: 1395-6560ft. (425-2000m.) Blooms Jun-Aug.	No potential	No suitable habitat is present within the Study Area.
Sidalcea neomexicana salt spring checkerbloom	None/None G4/S2 2B.2	Perennial herb. Chaparral, coastal scrub, lower montane coniferous forest, mojavean desert scrub, playas. Alkali springs and marshes. Elevations: 50-5020ft. (15-1530m.) Blooms Mar-Jun.	No potential	No suitable habitat is present within the Study Area.
Symphyotrichum defoliatum San Bernardino aster	None/None G2/S2 1B.2	Perennial rhizomatous herb. Cismontane woodland, coastal scrub, lower montane coniferous forest, marshes and swamps, meadows and seeps, valley and foothill grassland. Vernally mesic grassland or near ditches, streams and springs; disturbed areas. Elevations: 5-6695ft. (2-2040m.) Blooms Jul-Nov.	Low potential	Suitable coastal scrub and valley and foothill grassland habitat is present within the Study Area along with mesic stream banks and disturbed areas. However, the Study Area is outside of this species documented geographic range and this species was not observed during the field survey when it should have been readily identifiable.
Tortula californica California screw moss	None/None G2G3/S2? 1B.2	Moss. Chenopod scrub, valley and foothill grassland. Moss growing on sandy soil. Elevations: 35-4790ft. (10-1460m.)	Low potential	Valley and foothill grassland habitat is present within the Study Area; however, the Study Area is well outside of this species documented geographic range.
Trichocoronis wrightii var. *wrightii* Wright's trichocoronis	None/None G4T3/S1 2B.1	Annual herb. Marshes and swamps, meadows and seeps, riparian forest, vernal pools. Mud flats of vernal lakes, drying river beds, alkali meadows. Elevations: 15-1425ft. (5-435m.) Blooms May-Sep.	No potential	No suitable habitat is present within the Study Area.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Study Area	Habitat Suitability/Observations
Invertebrates				
Bombus crotchii Crotch bumble bee	None/SCE G2/S2	Coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include *Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia,* and *Eriogonum*.	Moderate potential	The Study Area is within this species documented geographic range and suitable food plants are present within the Study Area. In addition, this species has been documented approximately 2.25 miles north of the Study Area. Suitable food genera were observed within the Study Area.
Branchinecta lynchi vernal pool fairy shrimp	FT/None G3/S3	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	No potential	No suitable habitat is present within the Study Area.
Danaus plexippus Monarch butterfly	FC/None G4T1T2Q\S2S3	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	No potential	The eucalyptus grove within the Study Area does not provide enough wind protection for this species. Additionally, the Study Area is generally too inland for this species to be considered a suitable overwintering grove and no CNDDB occurrences have been documented within the 9-quad search area.
Euphydryas editha quino quino checkerspot butterfly	FE/None G5T1T2/S1S2	Sunny openings within chaparral and coastal sage shrublands in parts of Riverside and San Diego counties. Hills and mesas near the coast. Need high densities of food plants *Plantago erecta, P. insularis,* and *Orthocarpus purpurescens.*	Low potential	Sunny openings of coastal sage scrub habitat is present within the Study Area and this species has been documented multiple times within 5 miles of the Study Area. However, this species prefers rolling hills and mesa landforms and the Study Area is moderately mountainous and contains copious rock outcroppings. Additionally, the Study Area is recovering from a fire and contains a moderate degree of disturbance.
Streptocephalus woottoni Riverside fairy shrimp	FE/None G1G2/S2	Endemic to Western Riverside, Orange, and San Diego counties in areas of tectonic swales/earth slump basins in grassland and coastal sage scrub. Inhabit seasonally astatic pools filled by winter/spring rains. Hatch in warm water later in the season.	No potential	No suitable habitat is present within the Study Area.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Study Area	Habitat Suitability/Observations
Amphibians				
Anaxyrus californicus arroyo toad	FE/None G2G3/S2 SSC	Semi-arid regions near washes or intermittent streams, including valley-foothill and desert riparian, desert wash, etc. Rivers with sandy banks, willows, cottonwoods, and sycamores; loose, gravelly areas of streams in drier parts of range.	No potential	The ephemeral wash within the Study Area does not appear to contain enough flow to create suitable breeding pools for this species. Therefore, it is unlikely that this species will breed and subsequently forage within the Study Area.
Rana muscosa southern mountain yellow-legged frog	FE/SE G1/S2 WL	Disjunct populations known from southern Sierras (northern DPS) and San Gabriel, San Bernardino, and San Jacinto Mtns (southern DPS). Found at 1,000 to 12,000 ft in lakes and creeks that stem from springs and snowmelt. May overwinter under frozen lakes. Often encountered within a few feet of water. Tadpoles may require 2 - 4 yrs to complete their aquatic development.	No potential	Outside of this species documented geographic range.
Spea hammondii western spadefoot	FPT/None G2G3/S3S4 SSC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	Low potential	It is unlikely that suitable breeding pools form within the Study Area. The grassland habitat within the Study Area is generally too steep and rocky for this species.
Reptiles				
Actinemys pallida southwestern pond turtle	FC/None G3G4/S3 SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	No potential	The drainages within the Study Area do not appear to contain water for long enough to support this species.
Anniella stebbinsi Southern California legless lizard	None/None G3/S3 SSC	Generally south of the Transverse Range, extending to northwestern Baja California. Occurs in sandy or loose loamy soils under sparse vegetation. Disjunct populations in the Tehachapi and Piute Mountains in Kern County. Variety of habitats; generally in moist, loose soil. They prefer soils with a high moisture content.	Moderate potential	Suitable habitat is present within the Study Area in the moist loose soils with sparse vegetation surrounding the ephemeral wash and the moist loose soils within and surrounding the drainage and the abandoned pump station site. However, the habitat within these areas is recovering from a fire and contains a moderate degree of anthropogenic induced disturbance.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Study Area	Habitat Suitability/Observations
Arizona elegans occidentalis California glossy snake	None/None G5T2/S2 SSC	Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular ranges, south to Baja California. Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils.	Moderate potential	Suitable scrub habitat with loose sandy soils is present within the undisturbed portions of the Study Area. However, the habitat within the Study Area is recovering from a fire and contains a moderate degree of anthropogenic induced disturbance.
Aspidoscelis tigris stejnegeri coastal whiptail	None/None G5T5/S3 SSC	Found in deserts and semi-arid areas with sparse vegetation and open areas. Also found in woodland and riparian areas. Ground may be firm soil, sandy, or rocky.	Moderate potential	Suitable semi-arid scrub habitat with sparse vegetation and open areas is present within the Study Area and this species has been documented multiple times within 5 miles of the Study Area. However, the habitat within the Study Area is recovering from a fire and contains a moderate degree of anthropogenic induced disturbance.
Charina umbratica southern rubber boa	None/ST G2G3/S2	Found in a variety of montane forest habitats. Previously considered morphologically intermediate, recent (2022) genomic analysis clarifies individuals from Mt Pinos, Tehachapi Mts, and southern Sierra Nevada are southern rubber boa. Found in vicinity of streams or wet meadows; requires loose, moist soil for burrowing; seeks cover in rotting logs, rock outcrops, and under surface litter.	No potential	No suitable habitat is present within the Study Area.
Coleonyx variegatus *abbotti* San Diego banded gecko	None/None G5T5/S1S2 SSC	Coastal and cismontane Southern California. Found in granite or rocky outcrops in coastal scrub and chaparral habitats.	Low potential	Suitable habitat is present within the Study Area; however, this species has not been documented north of San Diego County.
Crotalus ruber red-diamond rattlesnake	None/None G4/S3 SSC	Chaparral, woodland, grassland, and desert areas from coastal San Diego County to the eastern slopes of the mountains. Occurs in rocky areas and dense vegetation. Needs rodent burrows, cracks in rocks or surface cover objects.	Moderate potential	Suitable arid scrub and grassland habitat is present within the Study Area along with rocky areas and rodent burrows. However, the Study Area is recovering from a fire and contains a degree of anthropogenic induced disturbance. Additionally, this species was previously documented within the Study Area.
Phrynosoma blainvillii coast horned lizard	None/None G4/S4 SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Moderate potential	Suitable habitat is present within the coastal scrub habitat and the sandy wash within the Study Area. However, the Study Area is recovering from a fire and contains a degree of anthropogenic induced disturbance.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Study Area	Habitat Suitability/Observations
Salvadora hexalepis virgultea coast patch-nosed snake	None/None G5T4/S3 SSC	Brushy or shrubby vegetation in coastal Southern California. Require small mammal burrows for refuge and overwintering sites.	Low potential	This species is known to occur in large, intact, patches of brushy chaparral or coastal sage scrub habitat which is generally lacking from the Study Area due to the recent fire.
Thamnophis hammondii two-striped gartersnake	None/None G4/S3S4 SSC	Coastal California from vicinity of Salinas to northwest Baja California. From sea to about 7,000 ft elevation. Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds and riparian growth.	No potential	The drainages within the Study Area do not appear to contain water for long enough to support this species.
Birds				
Agelaius tricolor tricolored blackbird	None/ST G1G2/S2 SSC	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	No potential	No suitable habitat is present within the Study Area.
Aquila chrysaetos golden eagle	None/None G5/S3 FP WL	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	Low potential	This species has the potential to nest along the rocky hillsides surrounding the Study Area but is not likely to nest within the Study Area due to its proximity to developed areas. The Study Area is generally too mountainous and rocky to be suitable foraging habitat for this species, but it could forage within the pump station site work area if it is nesting in the area.
Athene cunicularia burrowing owl	None/None G4/S2 SSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	No potential	The Study Area is too mountainous and rocky for this species. No sign was observed during the survey.
Campylorhynchus brunneicapillus sandiegensis coastal cactus wren	None/None G5T3Q/S2 SSC	Southern California coastal sage scrub. Wrens require tall opuntia cactus for nesting and roosting.	No potential	No suitable habitat is present within the Study Area.
Circus hudsonius northern harrier	None/None G5/S3 SSC	Coastal salt and freshwater marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain cienagas. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	No potential	No suitable habitat is present within the Study Area.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Study Area	Habitat Suitability/Observations
Coccyzus americanus occidentalis western yellow-billed cuckoo	FT/SE G5T2T3/S1	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	No potential	No suitable habitat is present within the Study Area.
Cypseloides niger black swift	None/None G4/S3 SSC	Coastal belt of Santa Cruz and Monterey counties; central and southern Sierra Nevada; San Bernardino and San Jacinto mountains. Breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above the surf; forages widely.	No potential	No suitable habitat is present within the Study Area.
Elanus leucurus white-tailed kite	None/None G5/S3S4 FP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	No potential	No suitable habitat is present within the Study Area.
Haliaeetus leucocephalus bald eagle	FD/SE G5/S3 FP	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.	No potential	No suitable habitat is present within the Study Area.
Lanius ludovicianus loggerhead shrike	None/None G4/S4 SSC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub and washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	Low potential	A wash and recovering riparian woodland habitat is present within the Study Area. However, this species prefers lowlands and open country which is absent from the Study Area.
Polioptila californica californica coastal California gnatcatcher	FT/None G4G5T3Q/S2 SSC	Obligate, permanent resident of coastal sage scrub below 2500 ft in Southern California. Low, coastal sage scrub in arid washes, on mesas and slopes. Not all areas classified as coastal sage scrub are occupied.	Moderate potential	Suitable coastal sage scrub habitat below 2,500 ft is present within the Study Area along with an arid wash. In addition, this species was documented approximately 600 ft southwest of the Study Area in 2001 and has been documented several other times within 5 miles of the Study Area. However, the Study Area is recovering from a recent fire and generally contains disturbed coastal sage scrub habitat.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Study Area	Habitat Suitability/Observations
Progne subis purple martin	None/None G5/S3 SSC	Inhabits woodlands, low elevation coniferous forest of Douglas-fir, ponderosa pine, and Monterey pine. Nests in old woodpecker cavities mostly; also in human-made structures. Nest often located in tall, isolated tree/snag.	No potential	No suitable habitat is present within the Study Area.
Setophaga petechia yellow warbler	None/None G5/S3 SSC	Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	Low potential	The riparian woodlands within the Study Area are highly damaged and recovering from a recent fire. Water is likely too ephemeral in the Study Area for this species.
Toxostoma bendirei Bendire's thrasher	None/None G4/S2 SSC	Migratory; local spring/summer resident in flat areas of desert succulent shrub/Joshua tree habitats in Mojave Desert. Nests in cholla, yucca, palo verde, thorny shrub, or small tree, usually 0.5 to 20 feet above ground.	No potential	No suitable habitat is present within the Study Area.
Vireo bellii pusillus least Bell's vireo	FE/SE G5T2/S3	Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 ft. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, Baccharis, mesquite.	No potential	No suitable habitat is present within the Study Area.
Xanthocephalus xanthocephalus yellow-headed blackbird	None/None G5/S3 SSC	Nests in freshwater emergent wetlands with dense vegetation and deep water. Often along borders of lakes or ponds. Nests only where large insects such as Odonata are abundant, nesting timed with maximum emergence of aquatic insects.	No potential	No suitable habitat is present within the Study Area.
Mammals				
Antrozous pallidus pallid bat	None/None G4/S3 SSC	Found in a variety of habitats including deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts in crevices of rock outcrops, caves, mine tunnels, buildings, bridges, and hollows of live and dead trees which must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Low potential (roosting); Moderate potential (foraging)	This species is highly sensitive to disturbance of roosting sites so the rocky outcrops within the Study Area are likely not suitable roosting habitat for this species. However, the species may roost farther upslope from the Study Area and has the potential to forage within the Study Area, especially the Component 1 Project Area.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Study Area	Habitat Suitability/Observations
Chaetodipus californicus femoralis Dulzura pocket mouse	None/None G5T3/S3 SSC	Found in a variety of habitats including coastal scrub, chaparral, and grassland in San Diego County, Baja California, and Mexico. Attracted to grass-chaparral edges.	No potential	Outside of this species documented geographic range.
Chaetodipus fallax fallax northwestern San Diego pocket mouse	None/None G5T3T4/S3S4 SSC	Inhabits coastal sage scrub, sagebrush scrub, grasslands, and chaparral communities. Found in open, sandy areas in southwestern California and northern Baja California. Prefers moderately gravelly and rocky substrates.	High potential	Suitable coastal sage scrub and grassland habitat is present in the Study Area along with open sandy areas and rocky substrates. Additionally, this species has been documented several times within 5 miles of the Study Area and suitable pocket mouse burrows were observed throughout the Study Area.
Chaetodipus fallax pallidus pallid San Diego pocket mouse	None/None G5T3T4/S3S4 SSC	Occurs in desert and arid coastal border areas in eastern San Diego, Riverside, and San Bernardino Counties. Habitats include desert wash, desert scrub, desert succulent scrub, and pinyon-juniper. Prefers sandy soils, usually with rocks or coarse gravel.	No potential	No suitable habitat is present within the Study Area.
Corynorhinus townsendii Townsend's big-eared bat	None/None G4/S2 SSC	Occurs throughout California in a wide variety of habitats. Most common in mesic sites, typically coniferous or deciduous forests. Roosts in the open, hanging from walls & ceilings in caves, lava tubes, bridges, and buildings. This species is extremely sensitive to human disturbance.	No potential	No suitable habitat is present within the Study Area.
Dipodomys merriami parvus San Bernardino kangaroo rat	FE/SCE G5T1/S1 SSC	Alluvial scrub vegetation on sandy loam substrates characteristic of alluvial fans and flood plains. Needs early to intermediate seral stages.	No potential	No suitable alluvial floodplain habitat is present within the Study Area.
Dipodomys stephensi Stephens' kangaroo rat	FT/ST G2/S3	Found primarily in annual and perennial grasslands, but also occurs in coastal scrub & sagebrush with sparse canopy cover. Prefers buckwheat, chamise, brome grass & filaree. Will burrow into firm soil and use the burrows of California ground squirrels and pocket gophers. Occurs only in southern California.	No potential	The Study Area is too mountainous and rocky for this species.
Lasiurus xanthinus western yellow bat	None/None G4G5/S3 SSC	Occurs in arid regions of the southwestern United States. Typically found in riparian woodlands, oak or pinyon-juniper woodland, desert wash, palm oasis habitats, and urban or suburban areas. Roosts in trees, often between palm fronds.	Low potential	Some marginal riparian woodland and oak woodland habitat is present within the Study Area; however, it is recovering from a fire and likely does not provide enough cover to be suitable roosting habitat for this species.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Study Area	Habitat Suitability/Observations
Neotoma lepida intermedia San Diego desert woodrat	None/None G5T3T4/S3S4 SSC	Occurs in scrub habitats of southern California from San Luis Obispo County to San Diego County.	Moderate potential	Suitable scrub habitat is present within the Study Area and one of this species preferred microhabitat components (i.e., rock outcrops) is present within the Study Area. Additionally, this species has been documented approximately 0.25 mi north of the Study Area in similar habitat. However, this species prefers moderately dense to dense canopy cover which is generally lacking from the Study Area due to the recent fire.
Onychomys torridus ramona southern grasshopper mouse	None/None G5T3/S3 SSC	Desert areas, especially scrub habitats with friable soils for digging. Prefers low to moderate shrub cover. Feeds almost exclusively on arthropods, especially scorpions and orthopteran insects.	No potential	No suitable habitat is present within the Study Area.
Perognathus longimembris brevinasus Los Angeles pocket mouse	None/None G5T2/S1S2 SSC	Lower elevation grasslands and coastal sage communities in and around the Los Angeles Basin. Open ground with fine, sandy soils. May not dig extensive burrows, hiding under weeds and dead leaves instead.	Low potential	The Study Area is generally too mountainous and high of an elevation for this species.
Perognathus longimembris internationalis Jacumba pocket mouse	None/None G5T2T3/S2 SSC	Desert riparian, desert scrub, desert wash, coastal scrub and sagebrush. Rarely found on rocky sites; uses all canopy coverages.	No potential	The Study Area is outside of this species documented geographic range.
Taxidea taxus American badger	None/None G5/S3 SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	No potential	The Study Area is too mountainous are rocky for this species.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Study Area	Habitat Suitability/Observations

ft. = feet; meter = m.

Regional Vicinity refers to within a 9-quad search radius of site.

Status (Federal/State)

FE = Federal Endangered
FT = Federal Threatened
FPE = Federal Proposed Endangered
FPT = Federal Proposed Threatened
FD = Federal Delisted
FC = Federal Candidate
SE = State Endangered
ST = State Threatened
SCE = State Candidate Endangered
SCT = State Candidate Threatened
SR = State Rare
SD = State Delisted
SSC = CDFW Species of Special Concern
FP = CDFW Fully Protected
WL = CDFW Watch List

CRPR (CNPS California Rare Plant Rank)

1A = Presumed extirpated in California, and rare or extinct elsewhere
1B = Rare, Threatened, or Endangered in California and elsewhere
2A = Presumed extirpated in California, but common elsewhere
2B= Rare, Threatened, or Endangered in California, but more common elsewhere

CRPR Threat Code Extension

.1 = Seriously endangered in California (>80% of occurrences threatened/high degree and immediacy of threat)
.2 = Moderately threatened in California (20-80% of occurrences threatened/moderate degree and immediacy of threat)
.3 = Not very endangered in California (<20% of occurrences threatened/low degree and immediacy of threat)

Other Statuses

G1 or S1 Critically Imperiled Globally or Subnationally (state)
G2 or S2 Imperiled Globally or Subnationally (state)
G3 or S3 Vulnerable to extirpation or extinction Globally or Subnationally (state)
G4/5 or S4/5 Apparently secure, common and abundant
GH or SH Possibly Extirpated – missing; known from only historical occurrences but still some hope of rediscovery
LR Locally Rare (Santa Barbara Botanical Gardens 2018)

Additional notations may be provided as follows

T – Intraspecific Taxon (subspecies, varieties, and other designations below the level of species)
Q – Questionable taxonomy that may reduce conservation priority
? – Inexact numeric rank

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APPENDIX C

DELINEATION OF STATE AND FEDERAL JURISDICTIONAL WATERS REPORT

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MISSION CANYON II BPS
APN 450-210-002

HEMET, RIVERSIDE COUNTY, CALIFORNIA

DELINEATION OF STATE AND FEDERAL JURISDICTIONAL WATERS

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October 2023

MISSION CANYON II BPS

HEMET, RIVERSIDE COUNTY, CALIFORNIA

DELINEATION OF STATE AND FEDERAL JURISDICTIONAL WATERS

The undersigned certify that the statements furnished in this report and exhibits present data and information required for this biological evaluation, and the facts, statements, and information presented is a complete and accurate account of the findings and conclusions to the best of our knowledge and beliefs.

Travis J. McGill
Director

Thomas J. McGill, Ph.D.
Managing Director

October 2023

Executive Summary

ELMT Consulting (ELMT) has prepared this Delineation of State and Federal Jurisdictional report for the Mission Canyon II BPS (project) located in Hemet, Riverside County, California. The jurisdictional delineation documents the regulatory authority of the U.S. Army Corps of Engineers (Corps), the Regional Water Quality Control Board (Regional Board), and the California Department of Fish and Wildlife (CDFW) pursuant to Section 401 and 404 of the Federal Clean Water Act (CWA), the California Porter-Cologne Water Quality Control Act, and Sections 1600 *et. seq.* of the California Fish and Game Code.[1]

A single unnamed drainage feature was observed within the boundaries of the project site. Drainage 1 correlates to a blueline stream which has been mapped as occurring within the project site by the National Wetlands Inventory (NWI). This drainage extends from northwest to southeast from the western boundary of the project site for approximately 634 linear feet before exiting the site at the eastern boundary. According to historic aerials, this drainage has existed within the project site since at least 1967. This drainage receives flows from offsite to the east upstream, and from the Santa Rosa Hills offsite to the north. This drainage exits the middle of the western boundary of the project site, where it flows into the adjacent parcel and beyond to the northwest.

The onsite ephemeral drainage feature is not a relatively permanent, standing, or continuously flowing body of water and, therefore, will not qualify as waters of the United States under the regulatory authority of the Corps (*Sackett v. EPA* (2022) 143 S. Ct. 1322, 1336). However, the onsite drainage feature will qualify was waters of the State and fall under the regulatory authority of the Regional Board and CDFW. Table ES-1 identifies the on-site jurisdictional including the total acreage of jurisdiction for each regulatory agency within the boundaries of the project site.

Table ES-1: Jurisdictional Area and Impact Analysis

Jurisdictional Feature	Stream Flow	Cowardin Class	Class of Aquatic Resource	Regional Board Jurisdiction		CDFW Jurisdiction	
				Acreage	Linear Feet	Acreage	Linear Feet
Drainage1	Ephemeral	Riverine	Non-Section 10 Non-Wetland	0.1	900	0.85	900
			TOTALS	**0.1**	**900**	0.85	**900**

Approximately 0.1 acre (900 linear feet) of non-wetland waters of the State occur on-site under the jurisdictional authority of the Regional Board. Likewise, the on-site drainage features exhibit characteristics consistent with CDFW's methodology and would be considered CDFW streambed totaling 0.85 acres (900 linear feet).

1 The field surveys for this jurisdictional delineation were conducted on January 26, 2023 pursuant to the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0* (Corps 2008); and *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports* (Corps 2017); *The MESA Field Guide: Mapping Episodic Stream Activity* (CDFW 2014); and a *Review of Stream Processes and Forms in Dryland Watersheds* (CDFW 2010).

Impacts to the on-site jurisdictional areas will require a Corps Approved Jurisdictional Determination or Waiver, Regional Board CWA Section Report of Waste Discharge, and a CDFW Section 1602 Lake and Streambed Alteration Agreement prior to Project implementation. Refer to Sections 1-7 for a detailed analysis of site conditions and regulatory requirements.

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APPENDIX

Section 1 Introduction

This delineation has been prepared for the proposed Mission Canyon II BPS Project in order to document the jurisdictional authority of the U.S. Army Corps of Engineers' (Corps), the Regional Water Quality Control Board (Regional Board), and the California Department of Fish and Wildlife (CDFW) pursuant to Section 401 and 404 of the Federal Clean Water Act (CWA), the California Porter-Cologne Water Quality Control Act, and Sections 1600 *et seq.* of the California Fish and Game Code. The analysis presented in this report is supported by a field survey of site conditions conducted on October 24, 2023.

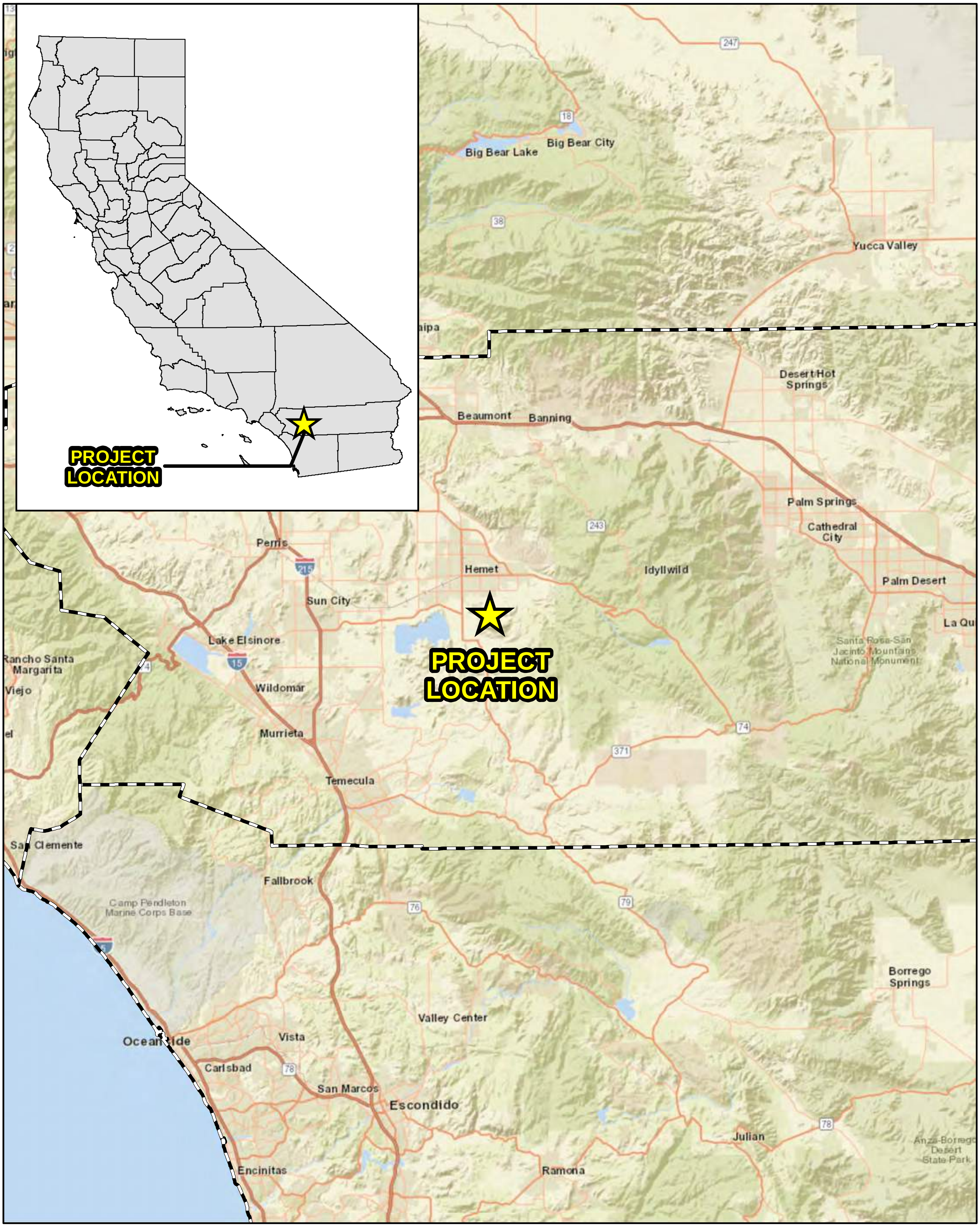
This jurisdictional delineation explains the methodology undertaken by ELMT Consulting (ELMT) to define the regulatory authority of the aforementioned regulatory agencies and document the findings made by ELMT. This report presents our best effort at documenting the jurisdictional boundaries using the most up-to-date regulations, written policy, and guidance from the regulatory agencies. Ultimately the regulatory agencies make the final determination of jurisdictional boundaries.

1.1 PROJECT LOCATION

The project site is generally located south of State Route 74, north and east of State Route 79, and west of Bautista Canyon Road in unincorporated Riverside County near the City of Hemet (Exhibit 1, *Regional Vicinity*). The site is depicted on the Hemet quadrangle of the United States Geological Survey's (USGS) 7.5-minute topographic map series in Section 25 of Township 5 South, Range 1 West. (Exhibit 2, *Site Vicinity*). Specifically, the project site is located off the northern shoulder of Gibbel Road, and lies northwest of Avery Canyon Road, and immediately south of the Santa Rosa Hills within Assessor's Parcel Number (APN) 450-210-002. (Exhibit 3, *Project Site*).

1.2 PROJECT DESCRIPTION

The Project proposes to construct a pump station. Refer to Appendix D, *Site Plan*.



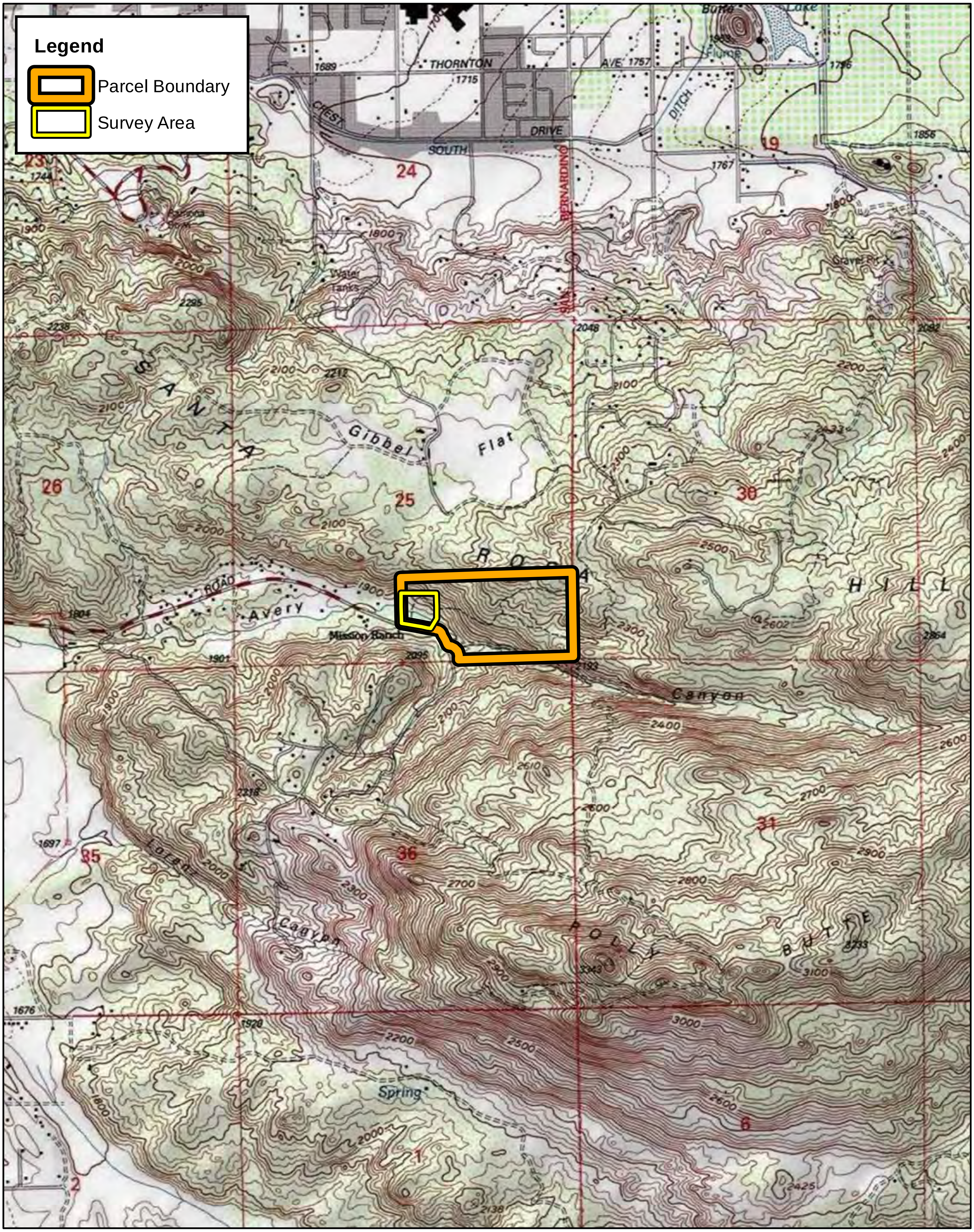
ELMT CONSULTING

Source: World Street Map, Riverside County

MISSION CANYON II BPS

Regional Vicinity

Exhibit 1



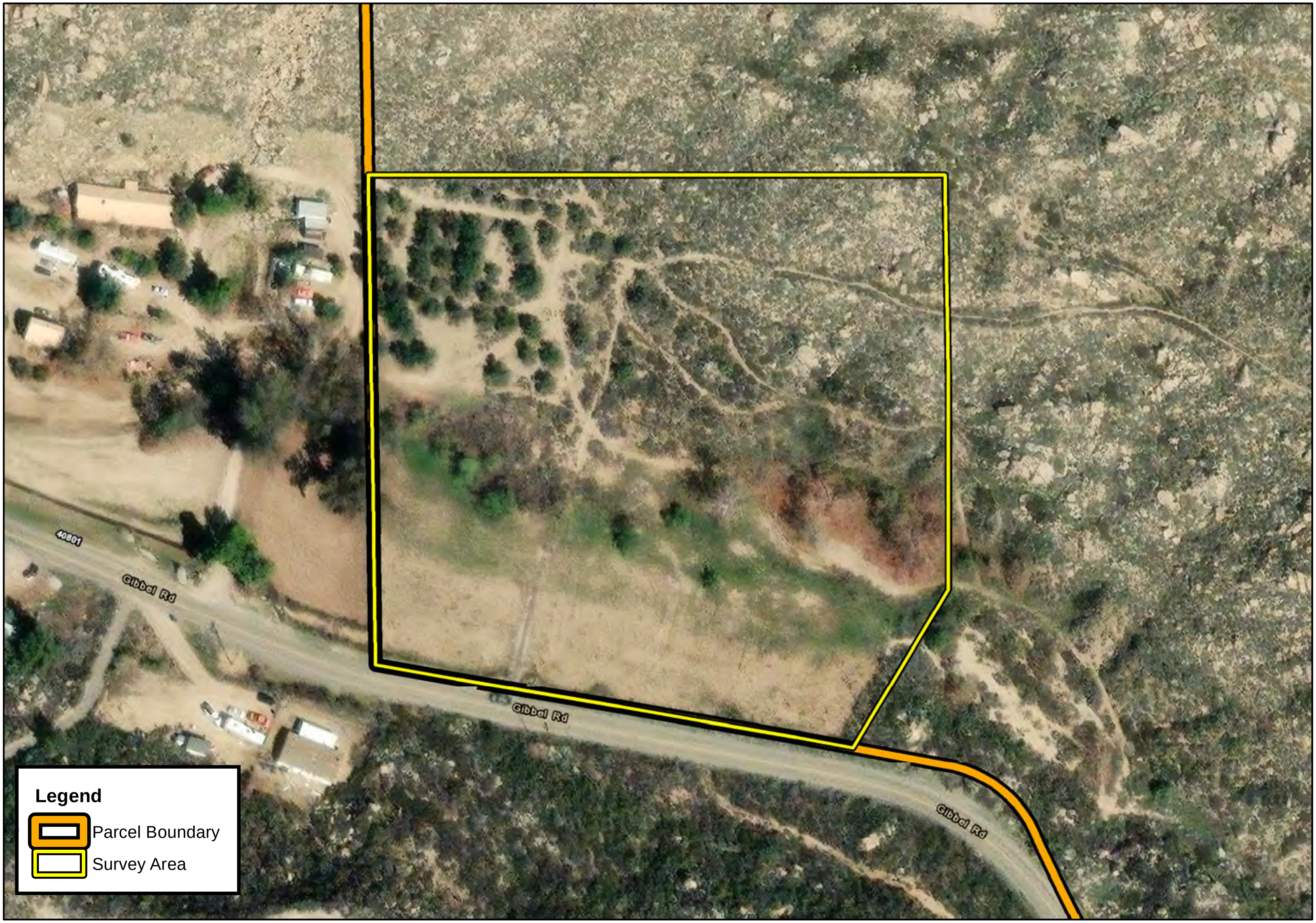
0 1,000 2,000 4,000 Feet

Source: USA Topographic Map, Riverside County

MISSION CANYON II BPS

Site Vicinity

Exhibit 2



ELMT CONSULTING

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Source: ESRI Aerial Imagery, Riverside County

MISSION CANYON II BPS

Project Site

Exhibit 3

Section 2 Regulations

There are three key agencies that regulate activities within inland streams, wetlands, and riparian areas in California. The Corps Regulatory Division regulates activities pursuant to Section 404 of the CWA, Section 10 of the Rivers and Harbors Act, and Section 103 of the Marine Protection, Research, and Sanctuaries Act. The Regional Board regulates activities pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act and the CDFW regulates activities under Sections 1600 *et seq*. of the California Fish and Game Code.

2.1 U.S. ARMY CORPS OF ENGINEERS

Since 1972, the Corps and U.S. Environmental Protection Agency (EPA) have jointly regulated the discharge of dredged or fill material into waters of the United States, including wetlands, pursuant to 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." The terms *waters of the United States* and *wetlands* are defined under CWA Regulations 33 Code of Federal Regulations (CFR) §328.3 (a) through (b).

2.2 REGIONAL WATER QUALITY CONTROL BOARD

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 Boards 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 (SWRCB) assumes this responsibility when a project has the potential to result in the discharge to waters within multiple Regional Boards.

Additionally, 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 Water Quality Control Act has become an important tool post *Solid Waste Agency of Northern Cook County vs. United States Corps of Engineers*[2] (SWANCC) and *Rapanos v. United States*[3] (Rapanos) court cases with respect to the State's regulatory authority over isolated and insignificant waters. Generally, any applicant proposing to discharge waste into a water body 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

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2 Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, 531 U.S. 159 (2001)
3 Rapanos v. United States, 547 U.S. 715 (2006)

waste substance associated with human habitation, the Regional Board also interprets this to include discharge of dredged and fill material into water bodies.

Under the State Water Resources Control Board Sate Wetland Definition, an area is a wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.

2.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Sections 1600 *et seq.* of the California Fish and Game Code establishes a fee-based process to ensure that projects conducted in and around lakes, rivers, or streams do not substantially adversely impact fish and wildlife resources, or, when adverse impacts cannot be avoided, ensures that adequate mitigation and/or compensation is provided. Pursuant to Section 1602 of the California Fish and Game Code, a notification must be submitted to the CDFW for any activity that will divert or obstruct the natural flow or alter the bed, channel, or bank (which may include associated biological resources) of a river or stream or use material from a streambed. One CDFW guidance document, although not a formally adopted rule or policy, requires notification for activities taking place within rivers or streams that flow perennially or episodically and that are defined by the area in which surface water currently flows, or has flowed, over a given course during the historic hydrologic regime, and where the width of its course can reasonably be identified by physical and biological indicators. If the project will not "substantially adversely affect an existing fish or wildlife resource," following notification to CDFW, the project may commence without an agreement with CDFW. (Fish & G. Code, § 1602(a)(4)(A)(i).)

Section 3 Methodology

The analysis presented in this report is supported by field surveys and verification of site conditions conducted on October 24, 2023. ELMT conducted a field delineation to determine the jurisdictional limits of “waters of the State” and jurisdictional streambed (including potential wetlands), located within the boundaries of the project site. While in the field, jurisdictional features were recorded on an aerial base map at a scale of 1" = 50' using topographic contours and visible landmarks as guidelines. Data points were obtained with a Garmin Map62 Global Positioning System to record and identify specific widths for ordinary high water mark (OHWM) indicators and the locations of photographs, soil pits, and other pertinent jurisdictional features, if present. This data was then transferred as a .shp file and added to the Project's jurisdictional exhibits. The jurisdictional exhibits were prepared using ESRI ArcInfo Version 10 software.

3.1 WATERS OF THE UNITED STATES

In the absence of adjacent wetlands, the limits of the Corps jurisdiction in non-tidal waters extend to the OHWM, which is defined as “ *. . . that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*”[4] Indicators of an OHWM are defined in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Corps 2008). An OHWM can be determined by the observation of a natural line impressed on the bank; shelving; changes in the character of the soil; destruction of terrestrial vegetation; presence of litter and debris; wracking; vegetation matted down, bent, or absent; sediment sorting; leaf litter disturbed or washed away; scour; deposition; multiple observed flow events; bed and banks; water staining; and/or change in plant community. The Regional Board shares the Corps’ jurisdictional methodology, unless SWANCC or Rapanos conditions are present. In the latter case, the Regional Board considers such drainage features to be jurisdictional waters of the State.

In accordance with the Revised Definition of “Waters of the United States”; Conforming (September 8, 2023), “waters of the United Sates” are defined as follows:

(a) ***Waters of the United States*** means:

(1) Waters which are:

(i) 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) The territorial seas; or

(iii) Interstate waters;

[4] CWA regulations 33 CFR §328.3(e).

(2) Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph (a)(5) of this section;

(3) Tributaries of waters identified in paragraph (a)(1) or (2) of this section that are relatively permanent, standing or continuously flowing bodies of water;

(4) Wetlands adjacent to the following waters:
(i) Waters identified in paragraph (a)(1) of this section; or
(ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters;

(5) Intrastate lakes and ponds not identified in paragraphs (a)(1) through (4) of this section that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (a)(1) or (a)(3) of this section

(b) The following are not “waters of the United States” even where they otherwise meet the terms of paragraphs (a)(2) through (5) of this section:

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

(2) Prior converted cropland designated by the Secretary of Agriculture. The exclusion would cease upon a change of use, which means that the area is no longer available for the production of agricultural commodities. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA;

(3) Ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water;

(4) Artificially irrigated areas that would revert to dry land if the irrigation ceased;
(5) Artificial lakes or ponds created by excavating or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing;
(6) Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating or diking dry land to retain water for primarily aesthetic reasons;

(7) Waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States; and

(8) Swales and erosional features (*e.g.*, gullies, small washes) characterized by low volume, infrequent, or short duration flow.

(c) In this section, the following definitions apply:

(1) ***Wetlands*** means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

(2) ***Adjacent*** means having a continuous surface connection

(3) ***High tide line*** means the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

(4) ***Ordinary high water mark*** means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

(5) ***Tidal waters*** means those waters that rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by hydrologic, wind, or other effects.

Pursuant to the Corps Wetland Delineation Manual (Corps 1987), the identification of wetlands is based on a three-parameter approach involving indicators of hydrophytic vegetation, hydric soils, and wetland hydrology. In order to qualify as a wetland, a feature must exhibit at least minimal characteristics within each of these three parameters. It should also be noted that both the Regional Board and CDFW follow the methods utilized by the Corps to identify wetlands. For this project location, Corps jurisdictional wetlands are delineated using the methods outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0* (Corps 2008).

3.2 WATERS OF THE STATE

3.2.1 REGIONAL WATER QUALITY CONTROL BOARD

The California *Porter-Cologne Water Quality Control Act* gives the Regional Board very broad authority to regulate waters of the State, which are defined as any surface water or groundwater, including saline waters. The Regional Board shares the Corps' methodology for delineating the limits of jurisdiction based on the identification of OHWM indicators and utilizing the three parameter approach for wetlands.

3.2.2 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Sections 1600 *et seq*. of the California Fish and Game Code applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the State. Generally, the CDFW's jurisdictional limit is not defined by a specific flow event, nor by the presence of OHWM indicators or the path of surface water as this path might vary seasonally. Instead, CDFW's jurisdictional limit is based on the topography or elevation of land that confines surface water to a definite course when the surface water rises to its highest point. Further, the CDFW's jurisdictional limit extends to include any habitat (e.g. riparian), including wetlands and vernal pools, supported by a river, stream, or lake regardless of the presence or absence of hydric soils and saturated soil conditions. For this project location, CDFW jurisdictional limits were delineated using the methods outlined in the *MESA Field Guide* (Brady, III and Vyverberg 2013) and *A Review of Stream Processes and Forms in Dryland Watersheds* (Vyverberg 2010), which were developed to provide guidance on the methods utilized to describe and delineate episodic streams within the inland deserts region of southern California.

Section 4 Literature Review

ELMT conducted a thorough review of relevant literature and materials to preliminarily identify areas that may fall under the jurisdiction of the regulatory agencies. A summary of materials utilized during ELMT's literature review is provided below and in Appendix A. In addition, refer to Section 8 for a complete list of references used throughout the course of this delineation.

4.1 WATERSHED REVIEW

The project site is located within the Lower San Jacinto River Watershed, which is a subset of the larger San Jacinto River Watershed (HUS 18070202). Diamond Valley Lake is located approximately 3.30 miles to the southwest of the project site. This feature receives flows from the San Jacinto Mountains and foothills. Discharge waters from Diamond Valley Lake flow southwest into Murrieta Creek, converging into Santa Margarita River before flowing further southwest past Camp Pendelton before reaching their terminus at the Pacific Ocean.

The Lower San Jacinto Watershed encompasses approximately 765 square miles in western Riverside County. This watershed is bounded by several mountain ranges, including the Badlands Mountain Range to the north, San Jacinto Mountains to the east, the Santa Ana Mountains to the west, and the Santa Margarita Mountains to the south. Currently, this watershed is primarily undeveloped. With natural open spaces at the headwaters areas and mostly agricultural and urban development in the middle and downstream areas.

The San Jacinto River Watershed consists of a single major drainage, the San Jacinto River, which is comprised of several smaller tributaries,. The San Jacinto River begins in the San Jacinto Mountains and veers northwest to follow the lower elevations of the San Jacinto Valley. The mainstem begins at the confluence of South Fork San Jacinto River and North Fork San Jacinto River. The most notable south-flowing tributary is the Perris Valley Storm Drain and Salt Creek flows westward from the San Jacinto Mountains to meet the San Jacinto River at Canyon Lake. The San Jacinto River is approximately 42 miles long, supports the majority of existing agricultural land in the San Jacinto Valley, and discharges into Canyon Lake, the overflow from which discharges into Lake Elsinore, which qualifies as a traditional navigable water (TNW). Discharges from Lake Elsinore drain into Walker Canyon, which is a tributary to Temescal Wash, and Temescal Wash is a tributary to the Santa Ana River, which ultimately conveys flows to the Pacific Ocean, a TNW.

4.2 LOCAL CLIMATE

Riverside County features a somewhat cooler version of a Mediterranean climate, or semi-arid climate, with warm, sunny, dry summers and cool, rainy, mild winters. Relative to other areas in Southern California, winters are colder with frost and with chilly to cold morning temperatures common. Climatological data obtained from nearby weather stations indicates the annual precipitation averages 11.2 inches per year. Almost all of the precipitation in the form of rain occurs in the months between December and March, with hardly any occurring between the months of April and November. The wettest month is February, with a monthly average total precipitation of 3.31 inches, and the driest months are June and July, both with monthly average total precipitation of 0.04 inch. The average maximum and minimum temperatures are 82.6 and 46.5 degrees Fahrenheit (° F) respectively with July and August (monthly average high 100° F) being the hottest months and December (monthly average low 34° F) being the coldest.

4.3 USGS TOPOGRAPHIC QUADRANGLE

The USGS 7.5 Minute Series Topographic Quadrangle maps show geological formations and their characteristics, describing the physical setting of an area through contour lines and major surface features including lakes, rivers, streams, buildings, landmarks, and other factors that may fall under an agency's jurisdiction. Additionally, the maps depict topography through color and contour lines, which are helpful in determining elevations and latitude and longitude within a project site.

The proposed project site is depicted on the Hemet quadrangle of the United States Geological Survey's (USGS) 7.5-minute topographic map series within Section 25 of Township 5 South, Range 1 West. The project site is ranges in elevation from 1,873 to 1,894 feet above mean sea level. On-site topography is somewhat variable and slopes generally from northeast to southwest. Areas of topographic relief include the northern boundary which leads to the Santa Rosa Hills, and the southeast corner of the project site.

4.4 AERIAL PHOTOGRAPHY

Prior to conducting the field delineation, ELMT reviewed current and historical aerial photographs (1967-2023) of the project as available from Google Earth Pro Imaging. Aerial photographs can be useful during the delineation process, as they often indicate the presence of drainage features and riverine habitat within the boundaries of the project site, if any.

The project site occurs in an area that historically supported undeveloped, vacant land. Land use in the vicinity of the site primarily supports residential development, with some municipal development scattered in the region. At present, the site is bounded to the north by undeveloped, vacant land and the Santa Rosa Hills; to the east by undeveloped, vacant land; to the south by Gibbel Road, with residential development beyond; and to the west by residential development.

The project site supports primarily undeveloped land which has been subjected to several decades of anthropogenic disturbances both within and surrounding the project site. Disturbances onsite include past agricultural practices, grading, weed abatement, off road vehicular use, and minor development. Historic aerials show these activities have been ongoing since at least 1967.

4.5 SOILS

On-site and adjoining soils were researched prior to the field visits using the U.S. Department of Agriculture National Resources Conservation Service and Soil Survey for Western Riverside Area, California. Soil surveys furnish soil maps and interpretations originally needed in providing technical assistance to farmers and ranchers; in guiding other decisions about soil selection, use and management; and in planning, research and disseminating the results of the research. In addition, soil surveys are now heavily utilized in order to obtain soil information with respect to potential wetland environments and jurisdictional areas (i.e., soil characteristics, drainage, and color). Based on the NRCS USDA Web Soil Survey, the project site is underlain by Cieneba rocky sandy loam (15 to 50 percent slopes, eroded), Gorgonio loamy sand (0 to 8 percent slopes), Gorgonio loamy sand (channeled 2 to 15 percent slopes), and Rockland. (Exhibit 4, *Soils*).

4.6 HYDRIC SOILS LIST OF CALIFORNIA

ELMT reviewed the USDA NRCS Hydric Soils List of California in an effort to verify whether on-site soils are considered to be hydric[5]. It should be noted that lists of hydric soils along with soil survey maps provide off-site ancillary tools to assist in wetland determinations, but they are not a substitute for field investigations. The presence of hydric soils is initially investigated by comparing the mapped soil series for the site to the County list of hydric soils. According to the hydric soils list, none of the on-site soils have been listed as hydric in Western Riverside County.

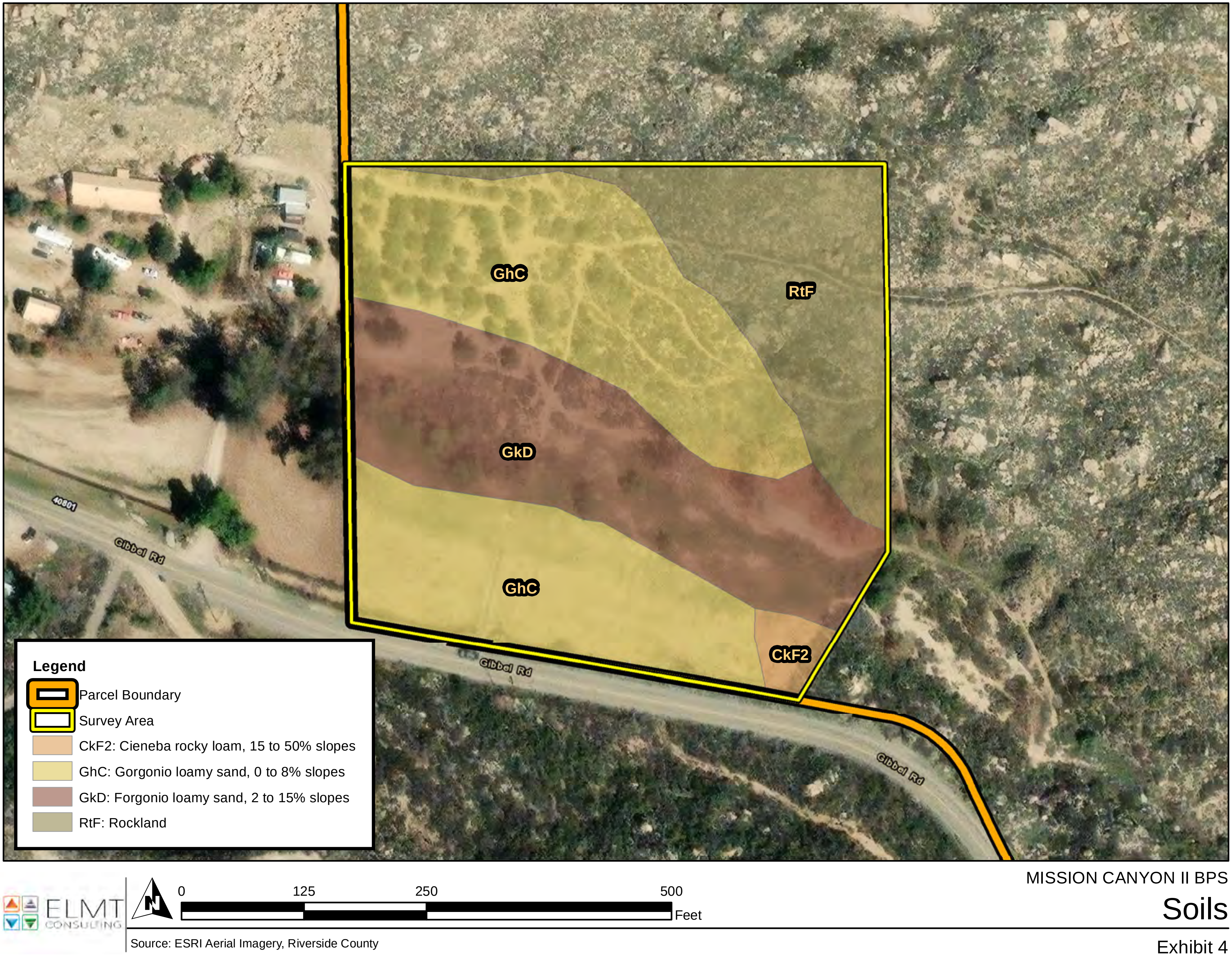
4.7 NATIONAL WETLANDS INVENTORY

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 immediate surrounding the project site. Based on this review, one blueline stream is mapped as occurring within the boundaries of the project site. This stream occurs in the northern region of the project site and runs east to west along the northern boundary. This blueline stream was mapped at the time of the field investigation and is referred to as Drainage 1 within the scope of this report. Refer to Appendix A, *Documentation*.

4.8 FLOOD ZONE

The Federal Emergency Management Act (FEMA) website was searched for flood data for the project site. Based on Flood Insurance Rate Map No. 06065C2110G the project site is located Zone X – areas determined to be within the 0.2% annual chance floodplain; and Zone X – areas determined to be outside the 0.2% annual chance floodplain, minimal risk of flooding. Refer to Appendix A, *Documentation*.

5 A hydric soil is a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part.



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Source: ESRI Aerial Imagery, Riverside County

MISSION CANYON II BPS

Soils

Exhibit 4

Section 5 Site Conditions

ELMT biologist Rachael A. Lyons conducted a field delineation on October 24, 2023, to verify existing site conditions and document the extent of potential jurisdictional areas within the boundaries of the project site. ELMT field staff encountered no limitations during the field delineation. Refer to Appendix B for representative photographs taken throughout the project site.

5.1 JURISDICTIONAL FEATURES

5.1.1 DRAINAGE FEATURES

ELMT carefully assessed the site for depressions, inundation, presence of hydrophytic vegetation, staining, cracked soil, ponding, and indicators of active surface flow and corresponding physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris. Suspected jurisdictional areas were checked for the presence of definable channels, soils, and hydrology.

Drainage 1

Drainage 1 extends northwest through the project site, from the eastern boundary to the western boundary. This drainage runs for approximately 634 linear feet within the boundaries of the project site. Drainage 1 is a natural earthen ephemeral streambed that receives flows from the Santa Rosa Hills to the north, and upstream areas to the southeast. Flows continue offsite to the west, through the existing residential houses where the flows are eventually conveyed through a culvert under Gibbel Road before reaching their terminus, where flows infiltrate approximately 1.78 miles northwest of the project site near State Steet and Simpson Road.

No surface water was present within Drainage 1. Evidence of an OHWM was observed via scour, changes in substrate, shelving, and lack of vegetation. The OHWM ranged from approximately 1-5 feet in width throughout the length of the drainage within site boundaries.

In-channel vegetation within site boundaries consisted of scarlet monkeyflower (*Mimulus cardinalis*), common sunflower (*Helianthus annus*), mulefat (*Baccharis salicifolia*), western sycamore (*Platanus racemosa*), Stebbins' hedgenettle (*Stachys stebbinsii*), Fremont cottonwood (*Populus fremontii*) and red willow (*Salix laevigata*).

5.1.2 WETLAND FEATURES

In order to qualify as a wetland, a feature must exhibit all three wetland parameters (i.e., vegetation, soils, and hydrology) described in the Corps Arid West Regional Supplement. While Drainage 1 supports riparian minima aquatic vegetation, it only conveys flows during and following storm events. This drainage does not hold water for long enough to create anaerobic conditions, ultimately forming hydric soils. Therefore, Drainage 1, observed within the boundaries of the project site, would not meet wetland requirements.

Section 6 Findings

This report presents the extent of jurisdictional features using the most up-to-date regulations, written policy, and guidance from the regulatory agencies. Please refer to the following sections for a summary of jurisdictional areas within the Project site.

6.1 U.S. ARMY CORPS OF ENGINEERS DETERMINATION

6.1.1 WATERS OF THE UNITED STATES DETERMINATION

The onsite ephemeral drainage feature is a not relatively permanent, standing, or continuously flowing body of water and, therefore, will not qualify as waters of the United States under the regulatory authority of the Corps (*Sackett v. EPA* (2022) 143 S. Ct. 1322, 1336).

6.1.2 WETLAND DETERMINATION

An area must exhibit all three wetland parameters described in the Corps Arid West Regional Supplement to be considered a jurisdictional wetland. Based on the results of the field delineation, it was determined that no areas within the Project site met all three wetland parameters. Therefore, no jurisdictional wetland features exist within the Project site.

6.2 REGIONAL WATER QUALITY CONTROL BOARD

Drainage 1 exhibits characteristics consistent with the Regional Board's methodology and would likely be considered jurisdictional waters of the State. Approximately 0.1 acres (900 linear feet) of non-wetland waters of the State occur on-site.

Table 1: Regional Board Jurisdictional Waters

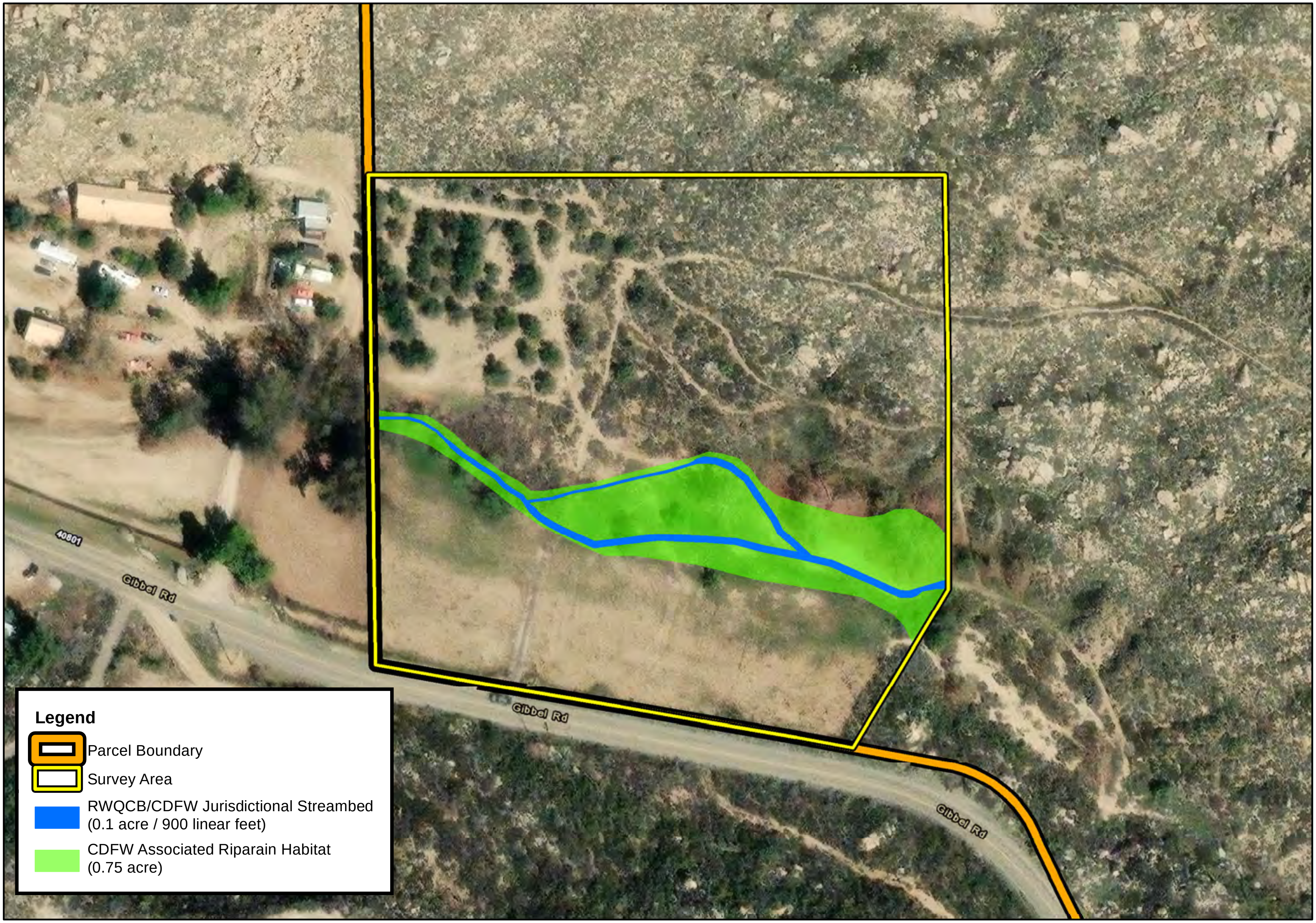
Jurisdictional Feature	Regional Board Jurisdiction **On-Site Jurisdiction** Acreage (Linear Feet)
Drainage 1	0.1 (900)
TOTAL	**0.1 (900)**

6.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Drainage 1 exhibits characteristics consistent with CDFW's methodology and would be considered CDFW streambed. Approximately 0.85 acre (900 linear feet) of CDFW jurisdiction was mapped within boundaries of the Project site.

Table 2: CDFW Jurisdictional Streambed

Jurisdictional Feature	CDFW Jurisdictional Streambed/Riparian Habitat
	On-Site Jurisdiction Acreage (Linear Feet)
Drainage 1	0.85 (900)
TOTAL	**0.85 (900)**



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0 125 250 500 Feet

Source: ESRI Aerial Imagery, Riverside County

MISSION CANYON II BPS

Jurisdictional Areas

Exhibit 5

Section 7 Regulatory Approval Process

The following is a summary of the various permits, certifications, and agreements that may be necessary prior to construction and/or alteration within jurisdictional areas. Ultimately the regulatory agencies make the final determination of jurisdictional boundaries and permitting requirements.

7.1 U.S. ARMY CORPS OF ENGINEERS

The Corps regulates discharges of dredged or fill materials into waters of the United States and wetlands pursuant to Section 404 of the CWA. No Corps jurisdictional areas were identified within the project site and a CWA Section 404 permit would not be required for the proposed project.

It recommended that the project applicant coordinate with the Corps to confirm existing site conditions and document the absence of Corps jurisdiction within the boundaries of the project site. The Corps may require an Approved Jurisdictional Determination (AJD) to be processed to confirm the absence of waters of the United States; however, they may waive the need for a AJD to be processed.

7.2 REGIONAL WATER QUALITY CONTROL BOARD

The Regional Board regulates discharges to surface waters pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act. Any impacts to on-site jurisdictional areas will require a Report of Waste Discharge prior to project implementation. Therefore, it will be necessary for the applicant to acquire a Report of Waste Discharge Certification prior to impacts occurring within Regional Board jurisdictional areas. The Regional Board also requires that California Environmental Quality Act (CEQA) compliance be obtained prior to obtaining the 401 Certification. A Regional Board Application fee is required with the application package and is calculated based on the acreage and linear feet of jurisdictional impacts.

7.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Pursuant to Section 1602 of the California Fish and Game Code, the CDFW regulates any activity that will divert or obstruct the natural flow or alter the bed, channel, or bank (which may include associated biological resources) of a river or stream. A Section 1602 Streambed Alteration Agreement from the CDFW will be required for impacts to the onsite drainage features prior to project implementation. The notification is based on the term and cost of a Project. The Section 1602 Streambed Alteration Agreement will not be issued until all fees are paid to the CDFW. CDFW also requires that CEQA compliance be obtained prior to issuance of the Streambed Alteration Agreement.

7.4 RECOMMENDATIONS

It is recommended that this delineation be forwarded to the regulatory agencies for their review and concurrence. The concurrence/receipt would solidify findings noted within this report.

Section 8 References

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California Department of Fish and Wildlife, *Lake and Streambed Alteration Program*. (https://www.wildlife.ca.gov/Conservation/LSA)

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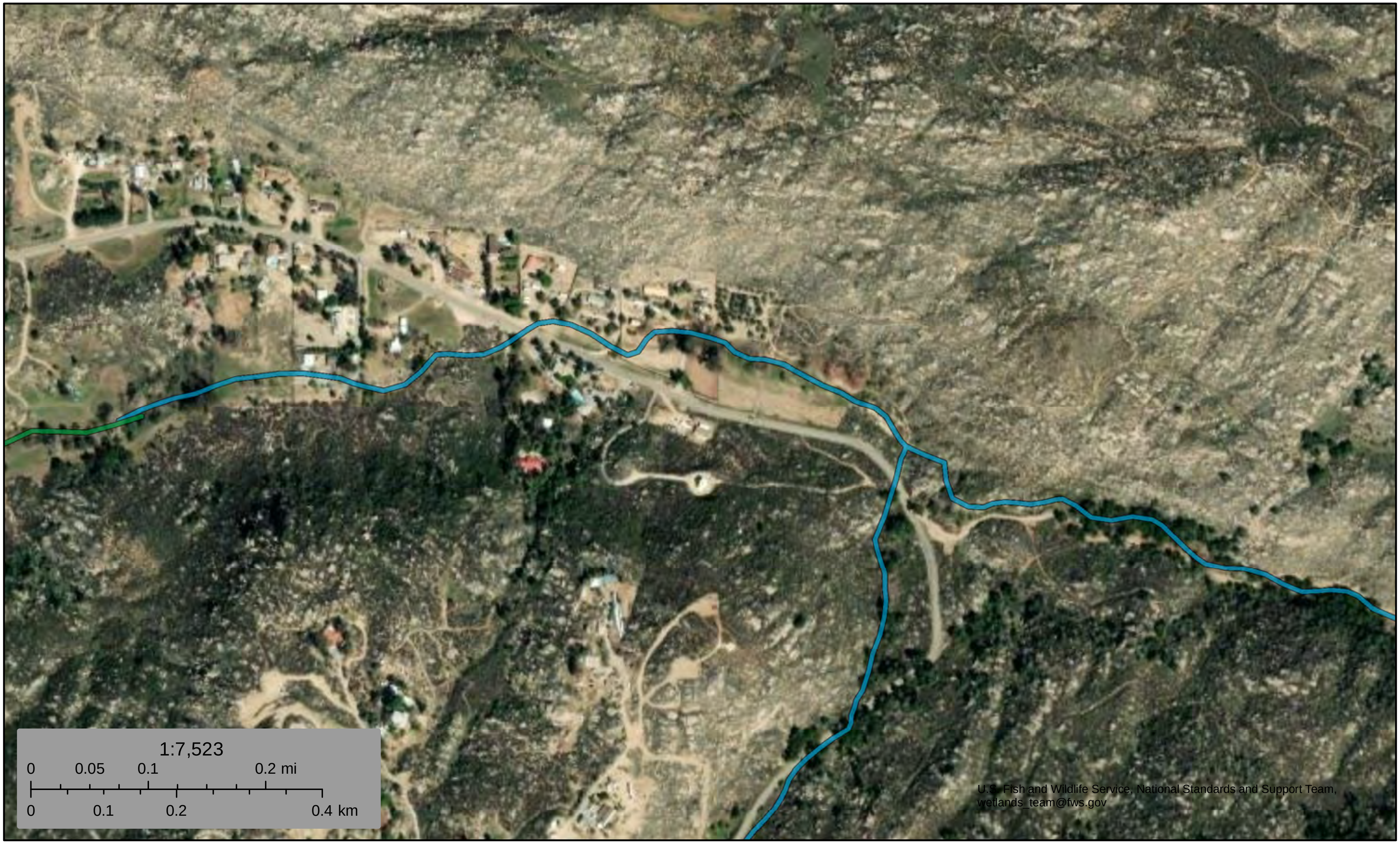
Appendix A Documentation

U.S. Fish and Wildlife Service
National Wetlands Inventory

Mission Canyon II BPS



November 3, 2023

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Appendix B Site Photographs

Photograph 1: From the western boundary of the project site, looking east through dense vegetation in Drainage 1.

Photograph 2: From the eastern boundary of the project site, looking west at Drainage 1.

Photograph 3: From the eastern boundary of the project site, looking east, outside of the project footprint, at Drainage 1.

Photograph 4: From the middle of Drainage 1, looking west.

Appendix C Methodology

WATERS OF THE UNITED STATES

Section 404 of the Clean Water Act

In accordance with the Revised Definition of "Waters of the United States"; Conforming (September 8, 2023), "waters of the United Sates" are defined as follows:

(a) ***Waters of the United States*** means:

(1) Waters which are:

(i) 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) The territorial seas; or

(iii) Interstate waters;

(2) Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph (a)(5) of this section;

(3) Tributaries of waters identified in paragraph (a)(1) or (2) of this section that are relatively permanent, standing or continuously flowing bodies of water;

(4) Wetlands adjacent to the following waters:

(i) Waters identified in paragraph (a)(1) of this section; or

(ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters;

(5) Intrastate lakes and ponds not identified in paragraphs (a)(1) through (4) of this section that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (a)(1) or (a)(3) of this section

(b) The following are not "waters of the United States" even where they otherwise meet the terms of paragraphs (a)(2) through (5) of this section:

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

(2) Prior converted cropland designated by the Secretary of Agriculture. The exclusion would cease upon a change of use, which means that the area is no longer available for the production of agricultural commodities. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA;

(3) Ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water;

(4) Artificially irrigated areas that would revert to dry land if the irrigation ceased;

(5) Artificial lakes or ponds created by excavating or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing;
(6) Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating or diking dry land to retain water for primarily aesthetic reasons;

(7) Waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States; and

(8) Swales and erosional features (*e.g.*, gullies, small washes) characterized by low volume, infrequent, or short duration flow.

(c) In this section, the following definitions apply:

(1) ***Wetlands*** means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

(2) ***Adjacent*** means having a continuous surface connection

(3) ***High tide line*** means the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

(4) ***Ordinary high water mark*** means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

(5) ***Tidal waters*** means those waters that rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by hydrologic, wind, or other effects.

WETLANDS

For this project location, Corps jurisdictional wetlands are delineated using the methods outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0* (Corps 2008). This document is one of a series of Regional Supplements to the Corps Wetland Delineation Manual (Corps 1987). The identification of wetlands is based on a three-parameter approach involving indicators of hydrophytic vegetation, hydric soil, and wetland hydrology. In order to be considered a wetland, an area must exhibit at least minimal characteristics within these three (3) parameters. The Regional Supplement presents wetland indicators, delineation guidance, and other information that is specific to the Arid West Region. In the field, vegetation, soils, and evidence of hydrology are examined using the methodology listed below and documented on Corps wetland data sheets, when applicable. It should be noted that both the Regional Board and the CDFW jurisdictional wetlands encompass those of the Corps.

Vegetation

Nearly 5,000 plant types in the United States may occur in wetlands. These plants, often referred to as hydrophytic vegetation, are listed in regional publications by the U.S. Fish and Wildlife Service (USFWS). In general, hydrophytic vegetation is present when the plant community is dominated by species that can tolerate prolonged inundation or soil saturation during growing season. Hydrophytic vegetation decisions are based on the assemblage of plant species growing on a site, rather than the presence or absence of particular indicator species. Vegetation strata are sampled separately when evaluating indicators of hydrophytic vegetation. A stratum for sampling purposes is defined as having 5 percent or more total plant cover. The following vegetation strata are recommended for use across the Arid West:

- *Tree Stratum:* Consists of woody plants 3 inches or more in diameter at breast height (DBH), regardless of height;
- *Sapling/shrub stratum:* Consists of woody plants less than 3 inches DBH, regardless of height;
- *Herb stratum:* Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size; and,
- *Woody vines:* Consists of all woody vines, regardless of size.

The following indicator is applied per the test method below.[1] Hydrophytic vegetation is present if any of the indicators are satisfied.

<u>Indicator 1 – Dominance Test</u>

[1] Although the Dominance Test is utilized in the majority of wetland delineations, other indicator tests may be employed. If one indicator of hydric soil and one primary or two secondary indicators of wetland hydrology are present, then the Prevalence Test (Indicator 2) may be performed. If the plant community satisfies the Prevalence Test, then the vegetation is hydric. If the Prevalence Test fails, then the Morphological Adaptation Test may be performed, where the delineator analyzes the vegetation for potential morphological features.

Cover of vegetation is estimated and is ranked according to their dominance. Species that contribute to a cumulative total of 50% of the total dominant coverage, plus any species that comprise at least 20% (also known as the "50/20 rule") of the total dominant coverage, are recorded on a wetland data sheet. Wetland indicator status in California (Region 0) is assigned to each species using the *National Wetland Plant List, version 2.4.0* (Corps 2012). If greater than 50% of the dominant species from all strata were Obligate, Facultative-wetland, or Facultative species, the criteria for wetland vegetation is considered to be met. Plant indicator status categories are described below:

- *Obligate Wetland (OBL):* Plants that almost always occur in wetlands;
- *Facultative Wetland (FACW):* Plants that usually occur in wetlands, but may occur in non-wetlands;
- *Facultative (FAC):* Plants that occur in wetlands and non-wetlands;
- *Facultative Upland (FACU):* Plants that usually occur in non-wetlands, but may occur in wetlands; and,
- *Obligate Upland (UPL):* Plants that almost never occur in wetlands.

Hydrology

Wetland hydrology indicators are presented in four (4) groups, which include:

<u>Group A – Observation of Surface Water or Saturated Soils</u>

Group A is based on the direct observation of surface water or groundwater during the site visit.

<u>Group B – Evidence of Recent Inundation</u>

Group B consists of evidence that the site is subject to flooding or ponding, although it may not be inundated currently. These indicators include water marks, drift deposits, sediment deposits, and similar features.

<u>Group C – Evidence of Recent Soil Saturation</u>

Group C consists of indirect evidence that the soil was saturated recently. Some of these indicators, such as oxidized rhizospheres surrounding living roots and the presence of reduced iron or sulfur in the soil profile, indicate that the soil has been saturated for an extended period.

<u>Group D – Evidence from Other Site Conditions or Data</u>

Group D consists of vegetation and soil features that indicate contemporary rather than historical wet conditions, and include shallow aquitard and the FAC-neutral test.

If wetland vegetation criteria is met, the presence of wetland hydrology is evaluated at each transect by recording the extent of observed surface flows, depth of inundation, depth to saturated soils, and depth to free water in the soil test pits. The lateral extent of the hydrology indicators are used as a guide for locating soil pits for evaluation of hydric soils and jurisdictional areas. In portions of the stream where the flow is divided by multiple channels with intermediate sand bars, the entire area between the channels is considered within the OHWM and the wetland hydrology indicator is considered met for the entire area.

Soils

A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper 16-20 inches.[2] The concept of hydric soils includes soils developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation. Soils that are sufficiently wet because of artificial measures are included in the concept of hydric soils. It should also be noted that the limits of wetland hydrology indicators are used as a guide for locating soil pits. If any hydric soil features are located, progressive pits are dug moving laterally away from the active channel until hydric features are no longer present within the top 20 inches of the soil profile.

Once in the field, soil characteristics are verified by digging soil pits along each transect to an excavation depth of 20 inches; in areas of high sediment deposition, soil pit depth may be increased. Soil pit locations are usually placed within the drainage invert or within adjoining vegetation. At each soil pit, the soil texture and color are recorded by comparison with standard plates within a *Munsell Soil Chart* (2009). Munsell Soil Charts aid in designating color labels to soils, based by degrees of three simple variables – hue, value, and chroma. Any indicators of hydric soils, such as organic accumulation, iron reduction, translocation, and accumulation, and sulfate reduction, are also recorded.

Hydric soil indicators are present in three groups, which include:

<u>All Soils</u>

“All soils” refers to soils with any United States Department of Agriculture (USDA) soil texture. Hydric soil indicators within this group include histosol, histic epipedon, black histic, hydrogen sulfide, stratified layers, 1 cm muck, depleted below dark surface, and thick dark surface.

<u>Sandy Soils</u>

“Sandy soils” refers to soil materials with a USDA soil texture of loamy fine sand and coarser. Hydric soil indicators within this group include sandy mucky mineral, sandy gleyed matrix, sandy redox, and stripped matrix.

[2] According to the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0 (Corps 2008), growing season dates are determined through on-site observations of the following indicators of biological activity in a given year: (1) above-ground growth and development of vascular plants, and/or (2) soil temperature.

<u>Loamy and Clayey Soils</u>

"Loamy and clayey soils" refers to soil materials with a USDA soil texture of loamy very fine sand and finer. Hydric soil indicators within this group include loamy mucky mineral, loamy gleyed matrix, depleted matrix, redox dark surface, depleted dark surface, redox depressions, and vernal pools.

SWANCC WATERS

The term "isolated waters" is generally applied to waters/wetlands that are not connected by surface water to a river, lake, ocean, or other body of water. In the presence of isolated conditions, the Regional Board and CDFW take jurisdiction through the application of the OHWM/streambed and/or the 3 parameter wetland methodology utilized by the Corps.

Appendix D Site Plan

ARDURRA

Eastern Municipal Water District
Mission Canyon II Pump Station

PROPOSED STAGING AREA

FIGURE
1

APPENDIX D

CULTURAL RESOURCES TECHNICAL REPORT

(Confidential Report – On File with Eastern Municipal Water District)

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APPENDIX E

GEOTECHNICAL INVESTIGATION

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September 7, 2023
Project No. A319-002

Ardurra Group, Inc.
14271 Danielson Street
Poway, California 92064

Attention: Ryan Huston, P.E.

Subject: Geotechnical Investigation
EMWD Mission Canyon II Booster Pump Station Replacement Project
Gibbel Road, Hemet, California

Dear Mr. Huston:

This report presents the findings of our geotechnical investigation for the proposed Mission Canyon II Booster Pump Station (BPS) Replacement Project.

The primary geotechnical issue is the presence of loose soil in the proposed BPS area and the potential for seismic liquefaction and settlement. A secondary issue is the potential for difficult excavation during pipeline construction. The report addresses these conditions and provides geotechnical engineering parameters and recommendations regarding project design and construction.

We appreciate the opportunity to work with you on this project. Please contact us if you have any questions or need any additional information.

Sincerely,
INLAND FOUNDATION ENGINEERING, INC.

REGISTERED PROFESSIONAL ENGINEER
ALLEN D. EVANS
No. 2060
GEOTECHNICAL
STATE OF CALIFORNIA

Allen D. Evans, P.E., G.E.
Principal

ADE:es
Distribution: Addressee

TABLE OF CONTENTS

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INTRODUCTION

This report presents the results of the geotechnical investigation conducted for the proposed Eastern Municipal Water District (EMWD) Mission Canyon II Booster Pump Station (BPS) Replacement project. The project also includes new and replacement pipeline in Gibbel Road. This report includes a summary of the site geologic conditions and geotechnical recommendations for project design and construction.

Our project understanding and scope of service were based on discussions with Ardurra and review of the following document and other project information provided.

- Pump Station Site Analysis Technical Memorandum, Mission Canyon II Pump Station Replacement Project (Spec No. 1496W), prepared by Ardurra, dated November 4, 2022

SCOPE OF SERVICE

The purpose of the geotechnical exploration and testing was to evaluate the subsurface conditions and to provide geotechnical engineering recommendations for the proposed booster pump station (BPS) replacement project. Our scope of service included:

- *Review of the general geologic conditions and specific subsurface conditions of the project site.*
- *Evaluation of the engineering and geologic data collected.*
- *Preparation of this report with geotechnical conclusions and recommendations for design and construction.*

The tasks performed to achieve these objectives included:

- *Collection and review of new and existing data relative to the site.*
- *Subsurface exploration consisting of eight (8) eight-inch diameter borings and two seismic refraction traverses to evaluate the nature and stratigraphy of the subsurface soil and to obtain representative samples for laboratory testing.*
- *Visual reconnaissance of the site and surrounding area to ascertain the presence of unstable or adverse geologic conditions.*
- *Laboratory testing of representative samples to evaluate the classification and engineering properties of the soil.*

- *Analysis of the data collected and the preparation of this report with geotechnical conclusions and recommendations.*

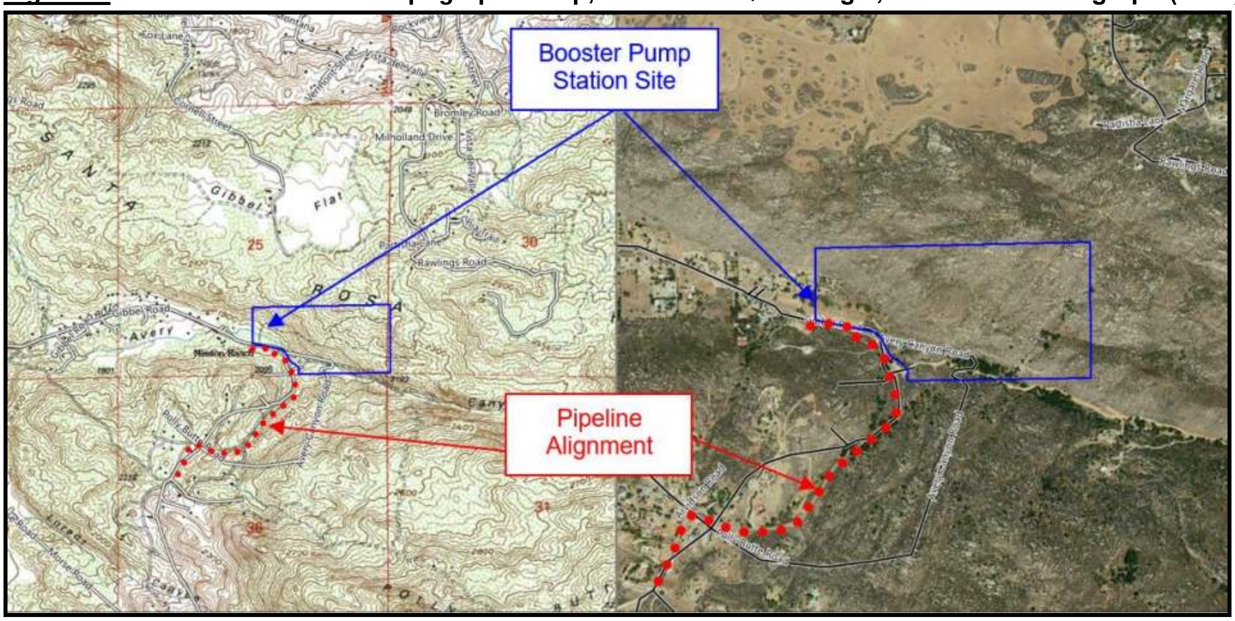
Evaluation of hazardous materials/waste was not within the scope of service provided. Evaluation of seismic hazards was based on field mapping, literature review and limited subsurface exploration.

PROJECT AND SITE DESCRIPTION

The project will include the design and construction of a new booster pump station (BPS), new 12-inch PVC pipeline and replacement 8-inch PVC pipeline. The new pump station will replace the existing Mission Canyon II Booster Pump Station that is located approximately 5,000 feet to the west, on the south side of Gibbel Road.

The new BPS site is located in the southerly portion of Section 25, Range 1 West, Township 5 South, SBB&M. The associated pipeline alignment is primarily located in the northwesterly portion of Section 36, Range 1 West, Township 5 South. Figure 1 below shows the location of the BPS parcel and pipeline alignment.

Figure 1: Site Location. USGS Topographic Map, Hemet 7.5' Quadrangle, and Aerial Photograph (2022)



The new BPS will be located on the north side of Gibbel Road, approximately 650 feet northwest of Avery Canyon Road. The BPS site is located in the southwest corner of assessor parcel number (APN) 450-210-022.

The Riverside County GIS website shows that the parcel occupies approximately 71 acres. Most of the parcel is characterized by an ascending slope to the northeast with numerous bedrock outcrops. Overall, elevation across the parcel ranges from approximately 1,880 feet mean sea level (msl) at the southwest corner near the proposed BPS to about 2,360 feet msl near the northeast parcel corner.

A drainage course mapped as a “blue line” stream from Avery Canyon crosses the southwest portion of the parcel from southeast to northwest. The drainage course is located to the north of the proposed BPS area as shown on Figure 2 below. Figure 2 also shows proposed hillside grading to the north of the drainage course.

<u>Figure 2:</u> Location of BPS, Drainage Course and Proposed Slope Grading

The proposed BPS site shown above, south of the drainage course, will occupy approximately 1.5 acres. The existing ground surface in the BPS area slopes the west and north at less than 2 percent. The new BPS will be constructed on a graded pad that will be approximately 6 to 8 feet higher than adjacent ground surface. Fill soil for the pad will be generated from the hillside grading to the north, or will be imported from other sources.

The proposed BPS building will be constructed of reinforced masonry (CMU) and will occupy approximately 376 sq. ft. It will be supported on shallow reinforced concrete footings with a slab-on-grade floor. Other site improvements will include an emergency generator, transformer and surge tank. The site will be paved with asphalt or concrete and enclosed with an 8-ft CMU wall.

The project also includes approximately 3,200 feet of new 12-inch PVC pipeline and 1,000 feet of 8-inch PVC replacement pipeline in Gibbel Road. The 12-inch pipeline will extend from the new BPS and connect to an existing 8-inch CML&C pipeline in Gibbel Road. The new 8-inch replacement pipeline will connect to an existing 6-inch CML&C pipeline at Polly Butte Road and extend north for 1,000 feet to the existing pipeline. Pipeline bottom depths are estimated to be within 5 feet of existing ground surface.

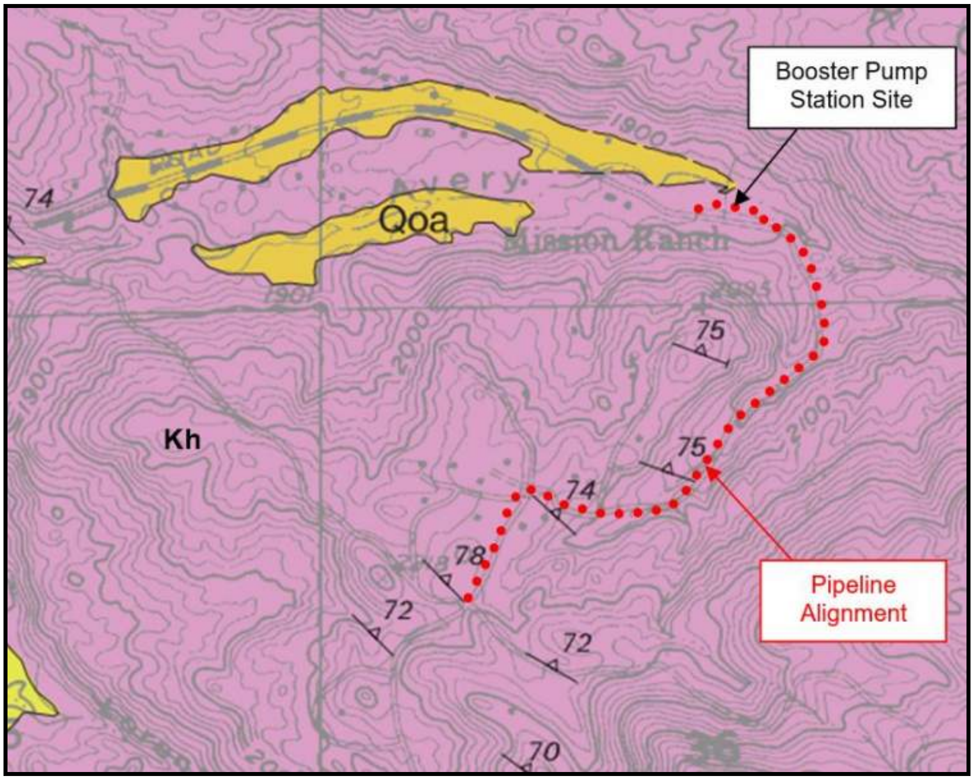
Gibbel Road is paved with asphalt concrete. Existing pavement will be sawcut for the proposed pipeline construction and will be replaced in kind with new hot-mix asphalt.

GEOLOGIC SETTING

Regional Geology: The subject site is situated in the northeasterly portion of the Peninsular Ranges geomorphic province. The Peninsular Ranges province is characterized by steep, elongated ranges and valleys that trend northwesterly. This geomorphic province encompasses an area that extends 125 miles, from the Transverse Ranges and the Los Angeles Basin, south to the Mexican border, and beyond another 795 miles to the tip of Baja California (Norris & Webb, 1990; Harden, 1998).

Local Geology: Locally, the project site is situated along low-lying hilly terrain within the northwesternmost portion of the Santa Rosa Hills. According to the Preliminary Geologic Map of the Hemet 7.5' Quadrangle (Morton & Matti, 2004), the proposed pump station site and associated pipeline alignment are underlain by granitic bedrock (map symbol Kh). Mapped old (late to middle Pleistocene) axial channel deposits (map symbol Qoa) are shown in the vicinity of the pump station site. Figure 3 below shows a portion of the referenced geologic map and the mapped geologic units in the vicinity of the project.

Figure 3: Preliminary Geologic Map of the Hemet 7.5' Quadrangle (Morton & Matti, 2004)



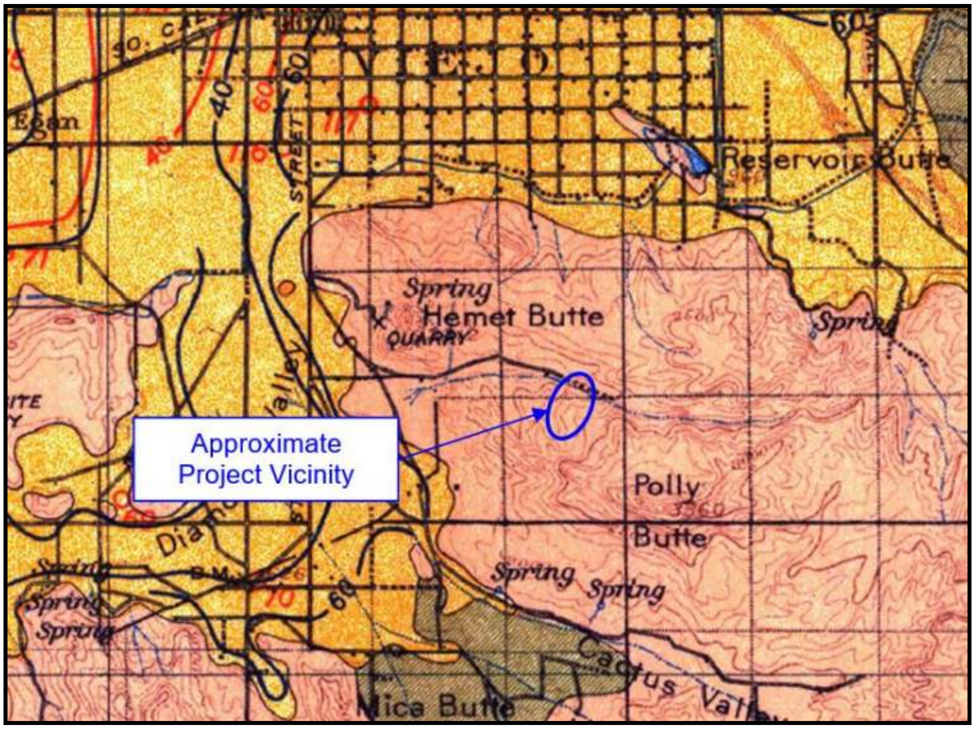
Kh	**Hemet pluton (Cretaceous)**—Heterogeneous plutonic assemblage consisting mainly of biotite-hornblende and biotite tonalite. Biotite
Qoa	**Old axial channel deposits (late to middle Pleistocene)**—Fluvial sediments. Consists of moderately indurated, commonly slightly dissected gravel, sand, silt, and clay-bearing alluvium. Locally capped by thin, discontinuous alluvial deposits of Holocene age

The proposed BPS site lies along a relatively flat-lying alluvial plain within Avery Canyon. Alluvial soils ranging in thicknesses from approximately 10 to 22.5 feet were encountered within the BPS area in exploratory borings B-07 and B-08.

Groundwater: According to the USGS Water Supply Paper (Waring, 1919), the site is underlain by formational materials not generally considered to be water-bearing. However, "trapped" water may be present in weathered areas and within fractures/joints in the bedrock. The prosed BPS site is located in the vicinity of a seasonal drainage.

Groundwater was encountered in our exploratory borings B-07 and B-08 (in the vicinity of the proposed BPS) at depths of approximately 7 and 14 feet, respectively, below ground surface. Groundwater was not encountered in any of the borings along the pipeline alignment, which extended to 10 feet below the existing ground surface.

Figure 4: **USGS Water Supply Paper (Waring, 1919)**



Igneous and metamorphic rock; not water bearing

Seasonal variation in groundwater depths is expected. Depending on seasonal precipitation and the potential rise in groundwater levels regionally, groundwater may be encountered during construction excavation, where it may cause instability within the alluvial soils exposed in the excavation sidewalls. Groundwater may also be encountered during excavation within the upper portions of the bedrock. Groundwater conditions observed during drilling may not accurately reflect conditions during or following periods of precipitation, or conditions that will be encountered during construction excavation.

Faulting: There are at least 38 late Quaternary active/potentially active faults that are within 100 kilometers of the site. Of these, there are no faults known to traverse the site, nor is there any photogeologic or surficial geomorphic evidence suggestive of faulting. In addition, the site is not located within a State of California "Alquist-Priolo Earthquake Fault Zone" for fault rupture hazard (CGS, 2023). Current mapping by the Riverside County Land Information System indicates that the site is not within a mapped County fault zone. The nearest mapped active fault is the Casa Loma segment of the San Jacinto Valley section of the San Jacinto Fault Zone, located approximately 2.4 miles northeast of the subject site. The San Jacinto Fault (San Jacinto Valley Segment, USGS, 2008) is a right-lateral, strike-slip fault, approximately 43 kilometers in length, with an estimated maximum moment magnitude (M_w) earthquake of M_w7.0 and an associated slip-rate of 18 mm/year.

The major faults influencing the site, distances and maximum earthquake magnitudes are presented in Table 1.

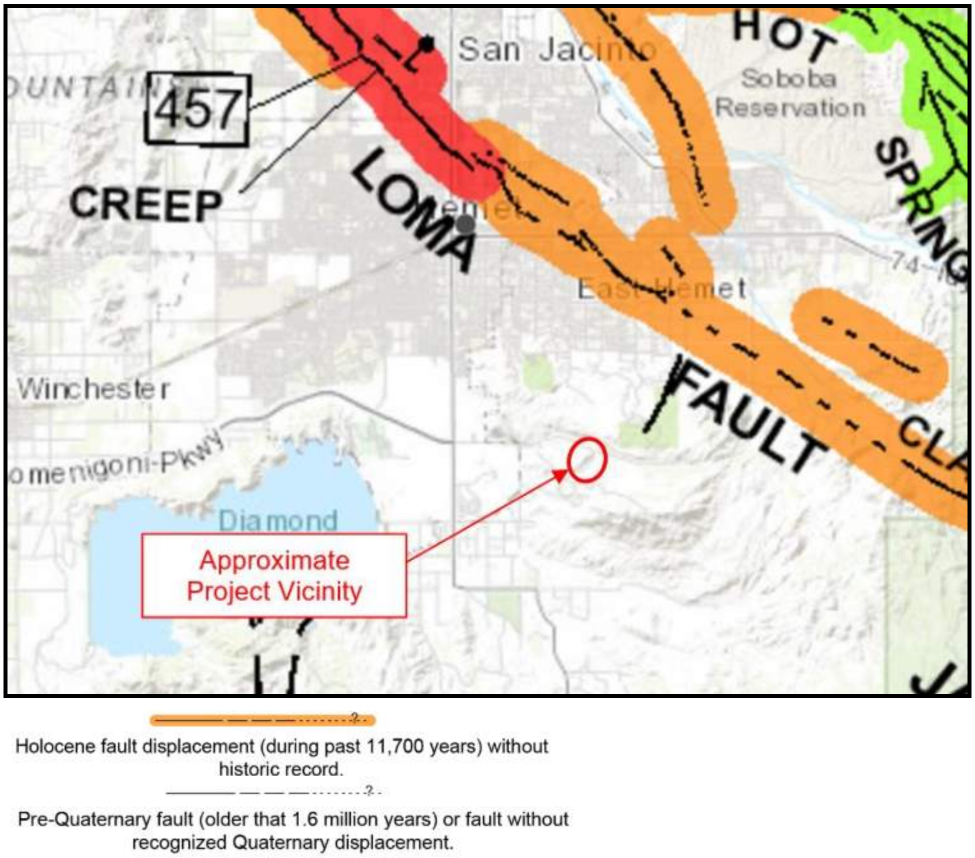
Table 1: Fault Zone, Distances and Maximum Earthquake Magnitudes

Fault Zone	Approximate Distance (Km)	Earthquake Magnitude (M_w)
San Jacinto - San Jacinto Valley (Casa Loma)	4.0	7.0
San Jacinto - Anza	4.5	7.2
Elsinore - Temecula	29.2	6.8
San Andreas - Southern	30.1	7.4

Published fault parameters indicate an estimated maximum moment magnitude (M_w) earthquake of 7.0 for the San Jacinto Valley segment of the San Jacinto fault zone. However, for seismic design purposes, based on published parameters for faults in California from the *Working Group on Earthquake Probabilities* (Field and others, 2008; Willis and others, 2008), we are considering that a cascading effect of rupture will occur along the entire length of the San Jacinto Fault Zone (which includes the San Bernardino Valley, San Jacinto Valley (Casa Loma), Anza, Clark, Borrego Springs, Coyote Creek, and Superstition Mountain fault segments collectively) rather than just the singular San Jacinto Valley segment. Based on the recently published rupture-model data (Petersen et al., 2008), the total rupture area of these combined faults is 4,017.3 square kilometers with an associated Maximum Moment Magnitude (M_W) of 7.8.

Figure 5 below is a portion of the CGS Fault Activity Map of California showing the approximate location of the site.

Figure 5: **Fault Activity Map of California, CGS, 2015**



Ground rupture is generally considered most likely to occur along pre-existing faults. Based on our limited review of published geologic maps, the potential for ground rupture at the site is considered to be low.

Seismic Parameters: The site coordinates (WGS 84) are ±33.7025° North / -116.9360° West. The web application U.S. Design Maps (OSHPD, 2023) was used to evaluate the seismic parameters for this project. Table 2 below summarizes the 2022 California Building Code (CBC) seismic design criteria, which is based on ASCE 7-16.

Table 2: 2022 CBC Seismic Design Parameters

Seismic Parameter	Value
S_s - MCE_R Ground Motion for 0.2-sec Period	1.993 g
S_1 - MCE_R Ground Motion for 1-sec Period	0.789 g
S_{MS} - Site-Modified Spectral Acceleration Value	2.392 g
S_{DS} - Numeric Seismic Design Value at 0.2-sec period	1.595 g
PGA - MCE_g Peak Ground Acceleration	0.842 g
F_{PGA} - Site Amplification Factor at PGA	1.2
PGA_M - Site Modified Peak Ground Acceleration	1.01 g
Site Class	D (default)

SUBSURFACE CONDITIONS

Subsurface conditions encountered in the exploratory borings are summarized below. More detailed descriptions are shown on the boring logs in Appendix A and as discussed in the *Geologic Setting* section of this report.

Soil Classification and Density: Exploratory borings conducted for this investigation on the proposed booster pump station (BPS) site encountered alluvial deposits predominately comprised of interbedded fine- to medium sand with silt (SP-SM) and silty sand (SM), underlain by highly to moderately weathered granitic bedrock to the depths explored. In boring B-07, bedrock was encountered at a depth of about 22.5 feet, with auger refusal at 33 feet. Above the bedrock, the soil encountered was generally loose to a depth of 12 feet and medium dense below 12 feet. In boring B-08, bedrock was encountered at a depth of about 10 feet, with auger refusal at 15.5 feet. Above the bedrock, the soil encountered was loose to about 5 feet and medium dense below 5 feet. The weathered bedrock encountered was very dense.

Borings for the new 12-inch pipeline (B-01, 02, 03 and 04) encountered granitic bedrock at depths of about 1.0 to 8.0 feet below ground surface. Above the bedrock, the soil encountered consisted generally of loose to medium dense silty sand (SM). Auger refusal in dense bedrock was encountered at a depth of about 8 feet in boring B-04.

Borings for the replacement 8-inch pipeline (B-05, 06) encountered granitic bedrock at depths of about 4 and 7 feet, respectively. Above the bedrock, the soil encountered consisted of medium dense to dense silty sand (SM). Both borings were drilled to 10 feet. No refusal was encountered.

Groundwater: Groundwater was encountered in exploratory borings B-07 and B-08 (in the vicinity of the proposed BPS) at depths of 7 feet and 14 feet, respectively, below the existing ground surface. Groundwater was not encountered in borings along the pipeline alignment, which extended to 10 feet below the existing ground surface. Above the groundwater, the soil encountered was slightly moist to moist. Samples obtained from below the encountered groundwater level were generally moist to wet.

Excavation and Rippability: A seismic refraction survey was performed by Terra Geosciences to evaluate the subsurface excavation and rippability characteristics at two locations. Seismic line S-1 was performed within the proposed BPS area just north of Gibbel Road. Seismic line S-2 was performed along the southeastern shoulder of Gibbel Road within the reach of the new 12-inch PVC pipeline. The approximate locations of the seismic refraction lines are shown on the attached site plan (Figure Nos. A-11a and 11b).

Following is a generalized discussion of the velocity layers described in the seismic refraction report. The Terra Geosciences report is appended and should be reviewed for further understanding of the methodology and limitations of this study.

BPS Site – Seismic Line S-1

At the BPS site, the uppermost V1 layer yielded a seismic velocity of 882 fps. This material correlates with the alluvial soil encountered in borings B-07 and B-08. It shows that the depth to bedrock increases from about 10 to 20 feet, east to west. The relatively low velocity indicates this material should be readily excavated with conventional equipment.

The lower V2 layer has a measured seismic velocity of 9,521 fps. Published correlation data from Caterpillar and Caltrans show that material with seismic velocity of this magnitude is non-rippable and blasting is normally required for excavation.

Grading for the proposed BPS is not expected to require excavation into bedrock. However, difficult excavation in hard rock could be encountered during grading of the hillside north of the drainage course.

Pipeline Alignment – Seismic Line S-2

The upper V1 layer yielded a seismic velocity of 1,562 fps and is likely composed of colluvium, topsoil, and/or completely weathered and fractured bedrock materials. No excavation difficulties are expected in this layer, which extends to a depth of about 2 to 6 feet below ground surface. This layer correlates with the silty sand (SM) soil encountered in boring B-04 to a depth of 4.5 feet

Velocity Layer V2 yielded a seismic velocity of 3,393 fps, which is generally typical for highly weathered granitic bedrock materials. These rocks may be generally homogenous with a relatively wide spaced joint/fracture system and/or may include relatively fresher boulders within a very highly weathered bedrock matrix. These materials appear to be present to depths of about 6 to 14 feet along the seismic line. This layer appears to correlate with the highly to moderately weathered granitic bedrock encountered in boring B-04 to a depth of 10 feet.

Velocity Layer V3 indicates the presence of slightly weathered granitic bedrock, with a seismic velocity range of 8,136 to 9,521 fps. Very difficult excavation within this deeper velocity layer should be anticipated if encountered. This layer may correlate with the depth of auger refusal in boring B-04, 8 feet below ground surface.

Other borings along the pipeline alignments were drilled to target depths of 10 feet without encountering refusal. Based on the conditions encountered in the borings and the data from seismic line S-2, excavation to depths of 6 feet should be achievable with conventional excavation equipment. However, isolated floaters (boulders, corestones, etc.) may be encountered locally that could result in difficult excavation.

Expansion and Collapse Potential: Expansion index (EI) testing was conducted on two representative near-surface samples from the BPS site. The testing indicated expansion index values of 22 and 39 for the samples tested. Although the soil expansion class is "low", the California Building Code (CBC) requires that slabs-on-grade be designed for soil expansion if constructed on soil with an expansion index higher than 20. Refer to the "Concrete Slabs-on-Grade" section of this report.

Consolidation testing indicates the native site soil is normally-consolidated and moderately compressible. The soil has a slight potential for collapse when saturated.

Liquefaction: The potential for soil liquefaction and seismically-induced settlement was evaluated using GeoSuite® software. Historical high groundwater was assumed to be at ground surface. Liquefaction and seismic settlement analysis was based on the simplified procedures developed by Seed and Idriss and modified by Idriss and Boulanger (2008). The results of the analysis indicate a total estimated settlement of more than 5 inches at ground surface due to seismic shaking. A discussion of the seismic settlement analysis, with graphic results, is included in Appendix C.

Corrosion: Analytical testing performed on a near-surface soil sample from boring B-07 indicates that sulfate concentrations are less than 0.10 percent. In accordance with ACI 201.2R, Table 6.1.4.1a, the soil can be classified as Class S0 with respect to sulfate exposure. ACI exposure classes for water-soluble sulfate in soil are shown in Table 3 below.

Table 3: ACI Exposure Classes for Water-Soluble Sulfate

Exposure Class	Water-soluble sulfate (SO_4^{2-}) in soil, % by mass
S0	$SO_4^{2-} < 0.10$
S1	$0.10 \leq SO_4^{2-} < 0.20$
S2	$0.20 \leq SO_4^{2-} < 2.00$
S3	$SO_4^{2-} > 0.20$

The tested chloride concentration of 18 ppm generally is not at a level high enough to be of concern with respect to corrosion of ferrous metals or concrete reinforcing steel. The soil is slightly alkaline with pH of 7.9.

The tested minimum saturated resistivity value of 31,015 ohm-cm indicates the soil is mildly corrosive with respect to buried ferrous metal. Specific corrosion control measures, such as coating of pipe with non-corrosive material or alternative non-metallic pipe material, may be necessary if there is a potential for saturated soil. Correlations between soil resistivity and ferrous metal corrosion are shown in the following Table 4.

Table 4: Correlation Between Soil Electrical Resistivity and Ferrous Metal Corrosion[1]

Soil Resistivity (ohm-cm)	Corrosivity Category
> 10,000	Mildly Corrosive
2,001 to 10,000	Moderately Corrosive
1,001 to 2,000	Corrosive
1 to 1,000	Severely Corrosive

[1]Romanoff, Melvin, Underground Corrosion, NBS Circular 579, Reprinted by NACE, 1989

IFE does not practice corrosion engineering. We recommend that a qualified corrosion engineer be consulted for additional guidance.

CONCLUSIONS AND RECOMMENDATIONS

On the basis of the field and laboratory exploration and testing, construction of the proposed Mission Canyon II BPS site improvements and pipeline is feasible from a geotechnical engineering standpoint. The primary issue at the BPS site requiring mitigation is the potential for liquefaction and associated seismic settlement. Our analysis indicates potential seismically-induced settlement at the site of more than 5 inches.

Another issue is the presence of near-surface granitic bedrock and the potential for difficult excavation along the pipeline alignments. Excavation should be generally achievable with conventional excavation equipment; however, isolated floaters (boulders, corestones, etc.) may be encountered locally that could result in difficult excavation.

All work should be performed in accordance with the specifications of Eastern Municipal Water District. The following sections present geotechnical recommendations for project design and construction.

BPS Foundation Design: All footings should be supported by compacted engineered fill soil, prepared as recommended in the Site Grading section of this report. Footings should have a minimum width of 12 inches and a minimum depth of 12 inches below finish grade. For the minimum width and depth, footings should be designed with an allowable bearing pressure of 2,600 pounds per square foot (psf). The allowable bearing pressure can be increased by an additional ⅓ for short-term transient wind and seismic loads.

Static settlement of footings designed and constructed as recommended herein is expected to be less than one inch. Differential settlement between foundations of similar size and load is expected to be less than one-half inch.

Potential seismic site settlement was analyzed to be approximately 5.3 inches. The estimated seismic differential settlement is 2.5 inches over 100 feet, or the length of the BPS site, or about one (1) inch in 40 feet (1/480).

The above settlement estimates are based on over-excavation and recompaction of the existing soil below the BPS, as discussed in the General Site Grading section of this report.

Reinforced concrete floor and mat foundations may be designed with a modulus of subgrade reaction (k_p) of 200 pounds per cubic inch (pci). This is suitable for loads applied to a concrete slab-on-grade placed on 12 inches of Class 2 aggregate base. The modulus of subgrade reaction (k_s) value for actual foundation dimensions should be calculated using the following equation from ACI 336.2R-88 (R2002):

$$k_s = k_p*(1/B)^{0.6} \quad \text{(B =footing width, ft.)}$$

Concrete Slabs-on-Grade: Potentially expansive soil is present in the BPS building area. The California Building Code (CBC) requires that slab-on-grade foundations on expansive soils be designed in accordance with *WRI/CRSI Design of Slab-on-Ground Foundations (1981)* or *PTI Standard Requirements for Analysis of Shallow Concrete Foundations on Expansive Soils (2012)*. Conventional slabs-on-grade may be utilized but should be supported by at least 24 inches of imported non-expansive soil.

Development of WRI/CRSI or PTI design parameters was beyond the scope of this investigation. This firm should be contacted if WRI/CRSI or PTI recommendations are required.

Slabs should be designed and constructed in accordance with the provisions of the American Concrete Institute (ACI). Slabs should be designed with a maximum modulus of subgrade reaction (k_p) of 200 pounds per cubic inch (pci). This is suitable for loads applied to a concrete slab-on-grade placed on 12 inches of Class 2 aggregate base.

The modulus of subgrade reaction (k_s) value for the actual slab dimensions should be calculated using the following equation from ACI 336.2R-88 (R2002):

$$k_s = k_p*(1/B)^{0.6} \quad \text{(B =footing width, ft.)}$$

Shrinkage of concrete should be anticipated and will result in cracks in all concrete slabs-on-grade. Shrinkage cracks may be directed to saw-cut "control joints" spaced on the basis of slab thickness and reinforcement. ACI recommends control joint spacing in unreinforced concrete at a maximum interval equal to the slab thickness times 24.

Slabs to receive moisture-sensitive coverings should be provided with a moisture vapor retarder/barrier designed and constructed according to the American Concrete Institute 302.1 R, Concrete Floor and Slab Construction, which addresses moisture vapor retarder/barrier construction. At a minimum, the vapor retarder/barrier should comply with ASTM EI745 and have a nominal thickness of at least 10 mils. The vapor retarder/barrier should be properly sealed, per the manufacturer's recommendations, and protected from punctures and other damage.

Lateral Earth Pressure / Friction Coefficient: Cantilever walls supporting native or compacted on-site fill soils should be designed using an equivalent active earth pressure of 40 pounds per cubic foot (pcf) for level backfill. Braced walls should be designed for at-rest earth pressure of 60 pcf, with the resultant applied at mid-height.

A passive equivalent fluid pressure of 240 pcf can be used for resistance to lateral loads against compacted fill or dense native soil. The upper foot of passive resistance should be ignored except where confined beneath a floor slab or pavement.

A coefficient of friction of 0.45 between soil and concrete is suitable for use with dead load forces only.

Asphalt Concrete Pavement: The following preliminary asphalt concrete structural pavement sections were calculated using an assumed R-value of 40 (based on classification of on-site soil types). At the completion of rough grading, the actual pavement subgrade soil should be evaluated, and possibly tested, to confirm that the following pavement sections are suitable.

Table 5: Preliminary Structural AC Pavement Sections

Service	Asphalt Concrete Thickness (ft.)	Base Course Thickness (ft.)
Light traffic (autos, parking areas, T.I. = 5.0)	0.20	0.40
Heavy traffic (trucks, driveways, T.I. =7.0)	0.30	0.65

IFE does not practice traffic engineering. The TI values used to develop the recommended pavement sections are typical for projects of this type. We recommend that the project civil engineer review the TIs to verify that they are appropriate for this project.

Excavation and Shoring: Existing soil at the well site and along the pipeline alignment should be readily excavated with conventional excavation and trenching equipment. All trenches and other excavations should be configured and shored in accordance with Cal/OSHA requirements. The site soil is classified as Type C, according to Cal/OSHA criteria.

The contractor should have a "competent person" on-site for the purpose of assuring safety within and about all construction excavations. For Type C soil, unshored excavations should have a maximum slope of 1.5:1 (H:V) and should not exceed twenty feet in height.

Shoring, shields, or other protective systems should be used in accordance with all specifications, recommendations, and limitations provided by the manufacturer. Braced shoring should be designed using an at-rest earth pressure of 60 pounds per cubic foot. Cantilever shoring should be designed using an active earth pressure of 40 pounds per cubic foot. A registered professional engineer should design shoring or benching for excavations deeper than twenty feet.

Pipe trench should be excavated to the line and grade shown on the drawings. The pipe trench should provide at least 12 inches of clearance between the edge of the pipe and the wall of the trench. The sides of the trench should be parallel to the pipe and maintained a uniform distance from the pipe.

If excavation for the pipe extends below the design invert grade, the bottom of the excavation should be refilled with approved material. Where soft or otherwise unstable materials are encountered, the excavation should be deepened and stabilized with gravel or other approved bedding material. All excavations should be free of trash, debris, or other unsuitable material prior to the placement of backfill.

Pipeline Bedding, Backfill and Compaction: All pipe excavation, bedding, backfill and compaction should be in accordance with EMWD Std. Dwg. B-286B, Trench Backfill, and the following recommendations.

<u>Pipe Bedding:</u> In general, the native soil <u>not</u> suitable for use as pipe bedding. Bedding should be placed so the pipe is uniformly supported. Bedding material should contain no rock larger than ¾ inches. Soft, unstable, or other unsuitable material encountered below the pipe invert should be removed and replaced with suitable on-site or imported

bedding material. Imported bedding material should meet the requirements below for imported pipe zone backfill.

Pipe Zone Backfill: Pipe zone backfill, extending from the top of pipe bedding to at least 12 inches over the top of pipe, should be free of organic matter and deleterious substances, contain no rocks larger than three (3) inches and no more than 15 percent rocks larger than two (2) inches. In general, the native soil at the BPS site and along the pipeline alignments is suitable for use as pipe zone backfill material.

Alternatively, imported pipe zone material can be used. Imported pipe zone backfill should consist of clean, cohesionless soil having a sand equivalent greater than 30 and fewer than 10% particles finer than the No. 200 Sieve.

To provide protection from particle migration, imported pipe zone material should also meet the following criteria:

$$D_{15} > 0.15 \text{ and } D_{50} < 5 \text{ mm},$$

where D_{15} and D_{50} represent bedding material particle sizes corresponding to 15 and 50 percent passing by weight, respectively. Concrete sand conforming to the requirements of ASTM C33 will meet the piping criteria for this project.

The minimum relative compaction within the pipe zone should be 90 percent unless otherwise specified. Flooding or jetting of pipe zone backfill is not recommended.

Trench Backfill: Trench backfill material over the pipe zone should be native or approved granular soil free of organic and deleterious materials, rocks or lumps greater than 3 inches in greatest dimension and other unsuitable material. In general, the native soil is suitable for use as trench backfill. Trench backfill should be compacted at near optimum moisture content by mechanical means as necessary for the achievement of satisfactory compaction. Flooding or jetting is not recommended. Unless otherwise specified by the drawings, specifications or encroachment permits, the minimum acceptable degree of compaction should be 90 percent of the maximum dry density. The upper 12 inches of soil subgrade below slabs or pavement should be compacted to a minimum of 95 percent relative compaction.

BPS Site Grading: All site grading should be performed in accordance with applicable provisions of the 2022 California Building Code, EMWD specifications and the following recommendations.

1. Clearing and Grubbing: All building, slab and pavement areas and all surfaces to receive compacted fill should be cleared of existing undocumented fill, loose soil, vegetation, debris, and other unsuitable materials. The conditions encountered in borings for this investigation indicate that removals as deep as four feet will be necessary to remove existing undocumented fill materials. Deeper removals may be necessary depending on the conditions exposed during clearing and grubbing.

2. Preparation of Surfaces to Receive Compacted Fill: All surfaces to receive compacted fill should be evaluate prior to fill placement. If loose soil, roots, or other unsuitable materials are encountered, deeper excavation may be necessary until satisfactory conditions are encountered. Upon approval, surfaces to receive fill should be scarified, brought to near optimum moisture content, and compacted to a minimum of 90 percent relative compaction.

3. Placement of Compacted Fill: Fill materials consisting of on-site soils or approved imported granular soil should be spread in shallow lifts and compacted at near optimum moisture content to a minimum of 90 percent relative compaction, based on ASTM D1557.

4. Preparation of BPS Building Area: The BPS building area should be excavated to a depth of at least 5 feet below existing site grades. The excavation should extend at least 5 feet outside of exterior building lines. The excavation bottom should be evaluated for suitability to receive fill, and then scarified and compacted as recommended above.

Following excavation bottom approval, approved fill soil should be placed in maximum 8-inch loose lifts to finish pad subgrade. The fill should be compacted to a minimum of 90 percent relative compaction.

5. Preparation of Non-Essential Foundation Areas: Non-essential foundation areas, such as for the perimeter CMU wall, should be excavated to a depth of at least 5 feet below adjacent finish grades, or to a depth below the bottom of the footing that is at least equal to the footing width, whichever is deeper. The excavation should extend at least five feet past the footing on both sides, where possible.

6. Preparation of Slab and Paving Areas: Slab and pavement subgrade soil should be processed and compacted to a depth of at least of 12 inches. Compaction below concrete slabs should be to a minimum of 90 percent relative compaction. Compaction within pavement areas should be to a minimum of 95 percent relative compaction for both subgrade and aggregate base.

7. Import Soil: All proposed import soil should be tested prior to placement on the site to verify that it is not corrosive or expansive. Recommended import soil criteria are shown in the following Table 6.

Table 6: Recommended Import Soil Criteria

Sieve Size	Recommended Criteria
Percent Passing 3-Inch Sieve	100
Percent Passing No. 4 Sieve	85 – 100
Percent Passing No. 200 Sieve	15 – 40
Plasticity Index	Less than 15
Expansion Index (ASTM D4829)	20 or less (very low)
Organic content	Less than 1 percent by weight
Sulfates	< 1,000 ppm
Min. Resistivity	> 10,000 ohm-cm

8. Testing and Observation: During all grading and backfilling, tests and observations should be performed by a representative of IFE to verify that the exposed subsurface conditions are as expected and that grading is performed in accordance with the project specifications. Density testing should be performed in accordance with the current ASTM D1556 or ASTM D6938 test methods.

LIMITATIONS

This report was prepared for Ardurra Group, Inc. (Ardurra) for use in the design and construction of the proposed Mission Canyon II Booster Pump Station Replacement project. This report may only be used by Ardurra for this purpose. The use of this report by other parties or for other purposes is not authorized without written permission by Inland Foundation Engineering, Inc.

The recommendations of this report are considered to be preliminary. The final design parameters should be confirmed during site excavation and grading on the basis of actual conditions exposed. To this extent, this report is not considered to be complete until the completion of both the design process and site preparation.

Evaluation of hazardous waste was not within the scope of service provided.

The findings and recommendations of this report are based on interpolation of soil conditions between and beyond boring locations. Soil conditions may be present that are different than those indicated in this report.

The information in this report represents professional opinions that have been developed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, either expressed or implied, is made.

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APPENDIX A – Site Exploration

APPENDIX A

SITE EXPLORATION

Eight exploratory borings were drilled with a truck-mounted hollow-stem auger drill rig at the approximate locations shown on Figure Nos. A-11a and A-11b. The materials encountered during drilling were logged by a staff geologist. Boring logs are included with this report as Figures A-3 through A-10.

Representative soil samples were obtained within the borings by driving a thin-walled steel penetration sampler with successive 30-inch drops of a 140-pound hammer. The numbers of blows required to achieve each six inches of penetration were recorded on the boring logs. Two different samplers were used; a Standard Penetration Test (SPT) sampler and a modified California sampler with brass sample rings. Representative bulk soil samples were also obtained from the auger cuttings. Samples were placed in moisture sealed containers and transported to our laboratory for further testing and evaluation. Laboratory tests results are discussed and included in Appendix B.

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487)

PRIMARY DIVISIONS			GROUP SYMBOLS	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIALS IS LARGER THAN #200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN #4 SIEVE	CLEAN GRAVELS (LESS THAN) 5% FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVEL WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN #4 SIEVE	CLEAN SANDS (LESS THAN) 5% FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS MORE THAN HALF OF MATERIALS IS SMALLER THAN #200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT IS LESS THAN 50	ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT IS GREATER THAN 50	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDS OR SILTS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
	HIGHLY ORGANIC SOILS		PT	PEAT, MUCK AND OTHER HIGHLY ORGANIC SOILS
TYPICAL FORMATIONAL MATERIALS	SANDSTONES		SS	
	SILTSTONES		SH	
	CLAYSTONES		CS	
	LIMESTONES		LS	
	SHALE		SL	

CONSISTENCY CRITERIA BASES ON FIELD TESTS

RELATIVE DENSITY – COARSE – GRAIN SOIL

RELATIVE DENSITY	SPT * (# BLOWS/FT)	RELATIVE DENSITY (%)
VERY LOOSE	<4	0-15
LOOSE	4-10	15-35
MEDIUM DENSE	10-30	35-65
DENSE	30-50	65-85
VERY DENSE	>50	85-100

CONSISTENCY – FINE-GRAIN SOIL

CONSISTENCY	SPT* (# BLOWS/FT)	TORVANE UNDRAINED SHEAR STRENGTH (tsf)	POCKET ** PENETROMETER UNCONFINED COMPRESSIVE STRENGTH (tsf)
Very Soft	<2	<0.13	<0.25
Soft	2-4	0.13-0.25	0.25-0.5
Medium Stiff	4-8	0.25-0.5	0.5-1.0
Stiff	8-15	0.5-1.0	1.0-2.0
Very Stiff	15-30	1.0-2.0	2.0-4.0
Hard	>30	>2.0	>4.0

* NUMBER OF BLOWS OF 140 POUND HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1 3/8 INCH I.D.) SPLIT BARREL SAMPLER (ASTM -1586 STANDARD PENETRATION TEST)

** UNCONFINED COMPRESSIVE STRENGTH IN TONS/SQ.FT. READ FROM POCKET PENETROMETER

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
DRY	Absence of moisture, dusty, dry to the touch
MOIST	Damp but no visible water
WET	Visible free water, usually soil is below water table

CEMENTATION

DESCRIPTION	FIELD TEST
Weakly	Crumbled or breaks with handling or slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

EXPLANATION OF LOGS

LOG OF BORING B-01

DRILLING RIG	Mobile B-61	DATE DRILLED	7/3/23	HAMMER TYPE	Auto-Trip
DRILLING METHOD	Rotary Auger			HAMMER WEIGHT	140-lb.
LOGGED BY	FWC			HAMMER DROP	30-inches
GROUND ELEVATION	+/-			BORING DIAMETER	8-inches

DEPTH (ft)	U.S.C.S.	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.	BULK SAMPLE	DRIVE SAMPLE	SAMPLE TYPE	BLOW COUNTS /6"	MOISTURE (%)	DRY UNIT WT. (pcf)
			ASPHALT CONCRETE, (3.5 inches)			AU			
	SM		**SILTY SAND,** fine to coarse, olive-brown (2.5Y 4/3), moist, loose.						
						SS AU	5 5	5	120
	SM		**SILTY SAND,** fine to medium, olive-brown (2.5Y 4/3), moist, loose to medium dense.						
						AU			
5	SM		**GRANITE,** highly to moderately weathered, olive-brown (2.5Y 4/3), degrades as silty sand (SM).			SS	7 19	7	128
10						SS	25 50/5"	6	128
			End of boring at 10 feet. No groundwater encountered. Backfilled with native soils.						

IFE Inland Foundation Engineering, Inc.

CLIENT	Ardurra Group, Inc.	FIGURE NO.
PROJECT NAME	Mission Canyon II Booster Pump Station	
PROJECT LOCATION	Gibbel Road, Hemet Area Riverside County, CA	
PROJECT NUMBER	A319-002	A-3

LOG OF BORING B-02

DRILLING RIG	Mobile B-61	HAMMER TYPE	Auto-Trip
DATE DRILLED	7/3/23	HAMMER WEIGHT	140-lb.
DRILLING METHOD	Rotary Auger	HAMMER DROP	30-inches
LOGGED BY	FWC	BORING DIAMETER	8-inches
GROUND ELEVATION	+/-		

SUMMARY OF SUBSURFACE CONDITIONS

This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.

DEPTH (ft)	U.S.C.S.	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS	BULK SAMPLE	DRIVE SAMPLE	SAMPLE TYPE	BLOW COUNTS /6"	MOISTURE (%)	DRY UNIT WT. (pcf)
			ASPHALT CONCRETE, (5 inches)						
	SM		**SILTY SAND,** fine to medium, very dark grayish-brown (2.5Y 3/2), moist, medium dense.						
	SM		**GRANITE,** highly to moderately weathered, olive-brown (2.5Y 4/3).			SS AU	12 21	5	134
						SS	50/5"	6	116
5									
						SS	50/1"	3	114
10									
			End of boring at 10 feet. No groundwater encountered. Backfilled with native soils.						

IFE Inland Foundation Engineering, Inc.

CLIENT	Ardurra Group, Inc.
PROJECT NAME	Mission Canyon II Booster Pump Station
PROJECT LOCATION	Gibbel Road, Hemet Area Riverside County, CA
PROJECT NUMBER	A319-002

FIGURE NO. A-4

LOG OF BORING B-03

DRILLING RIG	Mobile B-61	DATE DRILLED	7/3/23
DRILLING METHOD	Rotary Auger	HAMMER TYPE	Auto-Trip
LOGGED BY	FWC	HAMMER WEIGHT	140-lb.
GROUND ELEVATION	+/-	HAMMER DROP	30-inches
		BORING DIAMETER	8-inches

DEPTH (ft)	U.S.C.S.	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.	BULK SAMPLE	DRIVE SAMPLE	SAMPLE TYPE	BLOW COUNTS /6"	MOISTURE (%)	DRY UNIT WT. (pcf)
			ASPHALT CONCRETE, (5 inches)						
	SM		**SILTY SAND,** fine to coarse, olive-brown (2.5Y 4/3) , slightly moist, medium dense.			AU			
						SS	9 8	5	124
	SM		**SILTY SAND,** fine to medium, dark grayish-brown (2.5Y 4/2), slightly moist, medium dense.			AU			
5	SM		**SILTY SAND,** with trace clay, fine to coarse, olive-brown (2.5Y 4/3), slightly moist, medium dense.			SS	9 13	3	111
	SP-SM		**GRANITE,** highly to moderately weathered, dark grayish-brown (2.5Y 4/2).			SS	50	1	122
10									
			End of boring at 10 feet. No groundwater encountered. Backfilled with native soils.						

Inland Foundation Engineering, Inc.

CLIENT	Ardurra Group, Inc.
PROJECT NAME	Mission Canyon II Booster Pump Station
PROJECT LOCATION	Gibbel Road, Hemet Area Riverside County, CA
PROJECT NUMBER	A319-002

FIGURE NO.
A-5

IFE BORING - GINT STD US LAB.GDT - 9/7/23 12:54 - P:\A319\002\GINT.GPJ

LOG OF BORING B-04

DRILLING RIG	Mobile B-61	HAMMER TYPE	Auto-Trip
DRILLING METHOD	Rotary Auger	HAMMER WEIGHT	140-lb.
LOGGED BY	FWC	HAMMER DROP	30-inches
GROUND ELEVATION	+/-	BORING DIAMETER	8-inches
DATE DRILLED	7/3/23		

SUMMARY OF SUBSURFACE CONDITIONS

This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.

DEPTH (ft)	U.S.C.S.	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLE TYPE	BLOW COUNTS /6"	MOISTURE (%)	DRY UNIT WT. (pcf)
		ASPHALT CONCRETE, (3 inches)	AU			
	SM	**SILTY SAND,** fine to medium, olive, slightly moist, medium dense.				
		GRANITE, highly to moderately weathered, dark gray (10YR 4/1), degrades as poorly graded sand with silt (SP-SM).	AU			
			SS	25 24	2	133
5	SM		SS	17 20	1	132

End of boring at 8 feet. Auger refusal. No groundwater encountered. Backfilled with native soils.

IFE Inland Foundation Engineering, Inc.

CLIENT	Ardurra Group, Inc.
PROJECT NAME	Mission Canyon II Booster Pump Station
PROJECT LOCATION	Gibbel Road, Hemet Area Riverside County, CA
PROJECT NUMBER	A319-002

FIGURE NO. A-6

LOG OF BORING B-05

DRILLING RIG	Mobile B-61	HAMMER TYPE	Auto-Trip
DRILLING METHOD	Rotary Auger	HAMMER WEIGHT	140-lb.
LOGGED BY	FWC	HAMMER DROP	30-inches
GROUND ELEVATION	+/-	BORING DIAMETER	8-inches

DATE DRILLED 7/3/23

DEPTH (ft)	U.S.C.S.	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.	BULK SAMPLE	DRIVE SAMPLE	SAMPLE TYPE	BLOW COUNTS /6"	MOISTURE (%)	DRY UNIT WT. (pcf)
			ASPHALT CONCRETE, (3 inches)			AU			
	SM		**SILTY SAND,** with trace clay, very fine to medium, dark-brown (10YR 3/3), slightly moist, medium dense, moderately cemented.			SS	14 24	3	117
						AU			
5	SM		**GRANITE,** highly to moderately weathered, olive-brown (2.5Y 4/4), degrades as poorly graded sand with silt (SP-SM).			SS	28 30	6	120
						SS	50/3"		
10			End of boring at 10 feet. No groundwater encountered. Backfilled with native soils.						

IFE Inland Foundation Engineering, Inc.

CLIENT	Ardurra Group, Inc.
PROJECT NAME	Mission Canyon II Booster Pump Station
PROJECT LOCATION	Gibbel Road, Hemet Area Riverside County, CA
PROJECT NUMBER	A319-002

FIGURE NO. A-7

LOG OF BORING B-06

DRILLING RIG	Mobile B-61	DATE DRILLED	7/3/23	HAMMER TYPE	Auto-Trip
DRILLING METHOD	Rotary Auger			HAMMER WEIGHT	140-lb.
LOGGED BY	FWC			HAMMER DROP	30-inches
GROUND ELEVATION	+/-			BORING DIAMETER	8-inches

SUMMARY OF SUBSURFACE CONDITIONS

This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.

DEPTH (ft)	U.S.C.S.	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS	BULK SAMPLE	DRIVE SAMPLE	SAMPLE TYPE	BLOW COUNTS /6"	MOISTURE (%)	DRY UNIT WT. (pcf)
			ASPHALT CONCRETE, (5 inches)						
	SM		**SILTY SAND,** fine to medium, olive-brown (2.5Y 4/3), slightly moist, medium dense to dense, moderately cemented.			AU			
						SS	25 48	4	130
5						SS	7 19	3	123
	SM		**GRANITE,** highly to moderately weathered, light olive-brown (2.5Y 6/6).			AU			
10						SS	50/4"	1	
			End of boring at 10 feet. No groundwater encountered. Backfilled with native soils.						

Inland Foundation Engineering, Inc.

CLIENT	Ardurra Group, Inc.
PROJECT NAME	Mission Canyon II Booster Pump Station
PROJECT LOCATION	Gibbel Road, Hemet Area Riverside County, CA
PROJECT NUMBER	A319-002

FIGURE NO.

A-8

IFE BORING - GINT STD US LAB.GDT - 9/7/23 12:54 - P:\A319\002\GINT.GPJ

LOG OF BORING B-07

DRILLING RIG	Mobile B-61	DATE DRILLED	7/3/23	HAMMER TYPE	Auto-Trip
DRILLING METHOD	Rotary Auger			HAMMER WEIGHT	140-lb.
LOGGED BY	FWC			HAMMER DROP	30-inches
GROUND ELEVATION	+/-			BORING DIAMETER	8-inches

DEPTH (ft)	U.S.C.S.	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.	BULK SAMPLE	DRIVE SAMPLE	SAMPLE TYPE	BLOW COUNTS /6"	MOISTURE (%)	DRY UNIT WT. (pcf)
	SW		**WELL GRADED SAND,** fine to medium, brown (10YR 4/3), slightly moist, loose.			AU			
						SS	5 6	2	102
5	SP-SM		**POORLY GRADED SAND with SILT,** fine to medium, dark grayish-brown (10YR 4/2), moist to wet, loose.			AU			
			▽			SS	6 9	12	108
10						SS	7 7	18	110
	SM		**SILTY SAND,** with trace clay, fine to medium, dark grayish-brown (10YR 4/2), wet, medium dense.			AU SS	5 10	15	118
15						SS	12 16	18	116
20	SP-SM		**SAND with SILT,** fine to medium, dark grayish-brown (10YR 4/2), wet, medium dense.			SPT	8 8	14	
25	SM		**GRANITE,** highly to moderately weathered, olive-brown (2.5Y 4/3).			SPT	50/2"	14	
30						SPT	50/3"	13	
			End of boring at 33 feet. Auger refusal. Groundwater encountered at 7 feet. Backfilled with native soils.						

IFE Inland Foundation Engineering, Inc.

CLIENT	Ardurra Group, Inc.	FIGURE NO.
PROJECT NAME	Mission Canyon II Booster Pump Station	
PROJECT LOCATION	Gibbel Road, Hemet Area	
	Riverside County, CA	
PROJECT NUMBER	A319-002	A-9

LOG OF BORING B-08

DRILLING RIG	Mobile B-61	DATE DRILLED	7/3/23	HAMMER TYPE	Auto-Trip
DRILLING METHOD	Rotary Auger			HAMMER WEIGHT	140-lb.
LOGGED BY	FWC			HAMMER DROP	30-inches
GROUND ELEVATION	+/-			BORING DIAMETER	8-inches

SUMMARY OF SUBSURFACE CONDITIONS

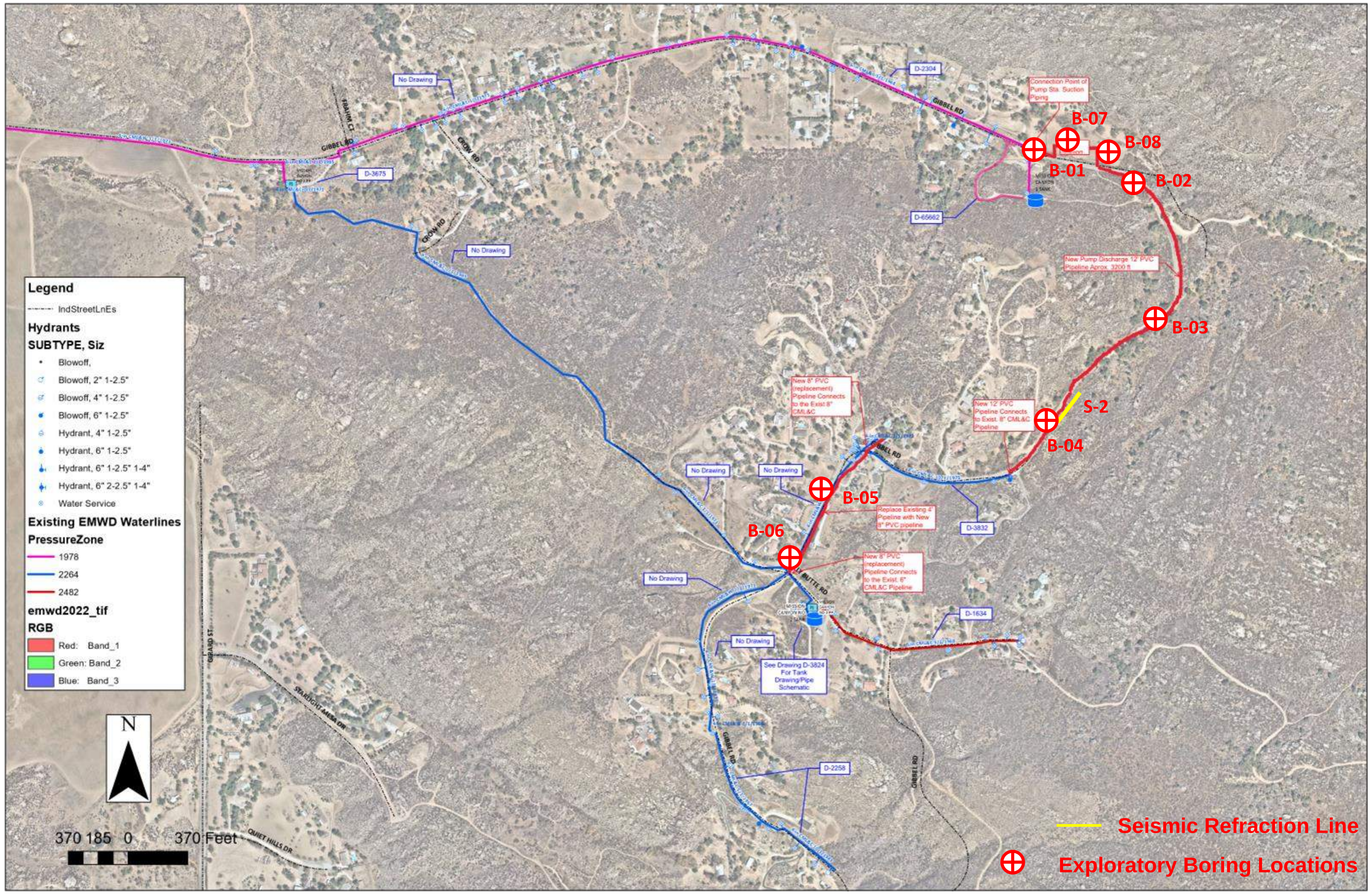
This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.

DEPTH (ft)	U.S.C.S.	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS	BULK SAMPLE	DRIVE SAMPLE	SAMPLE TYPE	BLOW COUNTS /6"	MOISTURE (%)	DRY UNIT WT. (pcf)
	SP-SM		**SAND with SILT,** fine to coarse, brown (10YR 4/3), slightly moist, loose.						
5	SP-SM		**POORLY GRADED SAND with SILT,** with trace clay, fine to coarse, dark grayish-brown (10YR 4/2), moist to very moist, medium dense.			SS AU	4 5	5	100
						SS	9 25	3	111
10	SM		**GRANITE,** highly to moderately weathered, wet, dark olive-gray (5Y 3/2).			AU SS	17 25	15	121
						SS	50/4"		
15						SS	50/2"		
			End of boring at 15.5 feet. Auger refusal. Groundwater encountered at 14 feet. Backfilled with native soils.						

IFE Inland Foundation Engineering, Inc.

CLIENT	Ardurra Group, Inc.
PROJECT NAME	Mission Canyon II Booster Pump Station
PROJECT LOCATION	Gibbel Road, Hemet Area Riverside County, CA
PROJECT NUMBER	A319-002

FIGURE NO. A-10



Geotechnical Exploration Plan
Mission Canyon II Booster Pump
Station (BPS) Replacement Project
Gibbel Road
Hemet, California

Base Map: EMWD Existing Water Facilities Map

N

IFE Inland Foundation Engineering, Inc.

1310 S. Santa Fe Avenue, San Jacinto, CA 92583 | (951) 654-1555

Figure No. A-11a	Geotechnical Exploration Plan Mission Canyon II Booster Pump Station Gibbel Road, Hemet, Ca	
	Drawn By: SD	Ardurra Group, Inc.
	Not to Scale	Date: September 2023

Geotechnical Exploration Plan
Mission Canyon II Booster Pump
Station (BPS) Replacement Project
Gibbel Road
Hemet, California

Base Map: EMWD HydroMapper

Seismic Refraction Line
Exploratory Boring Locations

N

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1310 S. Santa Fe Avenue, San Jacinto, CA 92583 | (951) 654-1555

Figure No. A-11b	Geotechnical Exploration Plan Mission Canyon II Booster Pump Station Gibbel Road, Hemet, Ca	
	Drawn By: SD	Ardurra Group, Inc.
	Not to Scale	Date: September 2023

APPENDIX B – Laboratory Testing

APPENDIX B

LABORATORY TESTING

Representative soil samples obtained from the borings were selected for laboratory testing. Descriptions of the tests performed are provided below.

Unit Weight and Moisture Content: Ring samples were weighed and measured to evaluate their unit weight. A small portion of each sample was then tested for moisture content. The testing was performed per ASTM D2937 and D2216. The results of this testing are shown on the boring logs (Figures A-3 through A-10).

Maximum Density-Optimum Moisture: Two soil samples were selected for maximum density testing in accordance with ASTM D1557. The maximum density is compared to the in-situ density of the soil to evaluate its relative compaction. The results of this testing are shown in the following table.

Boring	Depth	Description of Material	Max Density (lbs/ft^3)	Optimum Moisture (%)
B-03	0.4	Silty sand (SM)	136.9	7.1
B-08	4.0	Poorly graded sand with silt (SP-SM)	122.9	11.3

Sieve Analysis: Eleven soil samples were selected for sieve analysis testing in accordance with ASTM D6913. These tests provide information for classifying the soil in accordance with the Unified Classification System. The results of this testing are shown on Figure Nos. B-3 through B-5.

Plastic Index: Six samples were selected for plastic index testing in accordance with ASTM D4318. This test provides information regarding soil plasticity and is also used for classifying the soil in accordance with the Unified Classification System. The results are shown on Figure Nos. B-3 through B-5.

Consolidation Testing: Two samples were selected for consolidation testing in accordance with ASTM D2435. This test is used to evaluate the magnitude and rate of settlement of a structure or earth fill. The results of this testing are presented graphically on Figures B-6 and B-7.

Direct Shear Strength: Three samples were selected and transported to AP Engineering and Testing in Pomona, California for direct shear strength testing in accordance with ASTM D3080. This testing measures the shear strength of the soil under various normal pressures and is used to develop parameters for foundation bearing capacity and lateral earth pressure. Test results are shown on Figure Nos. B-8 through B-10.

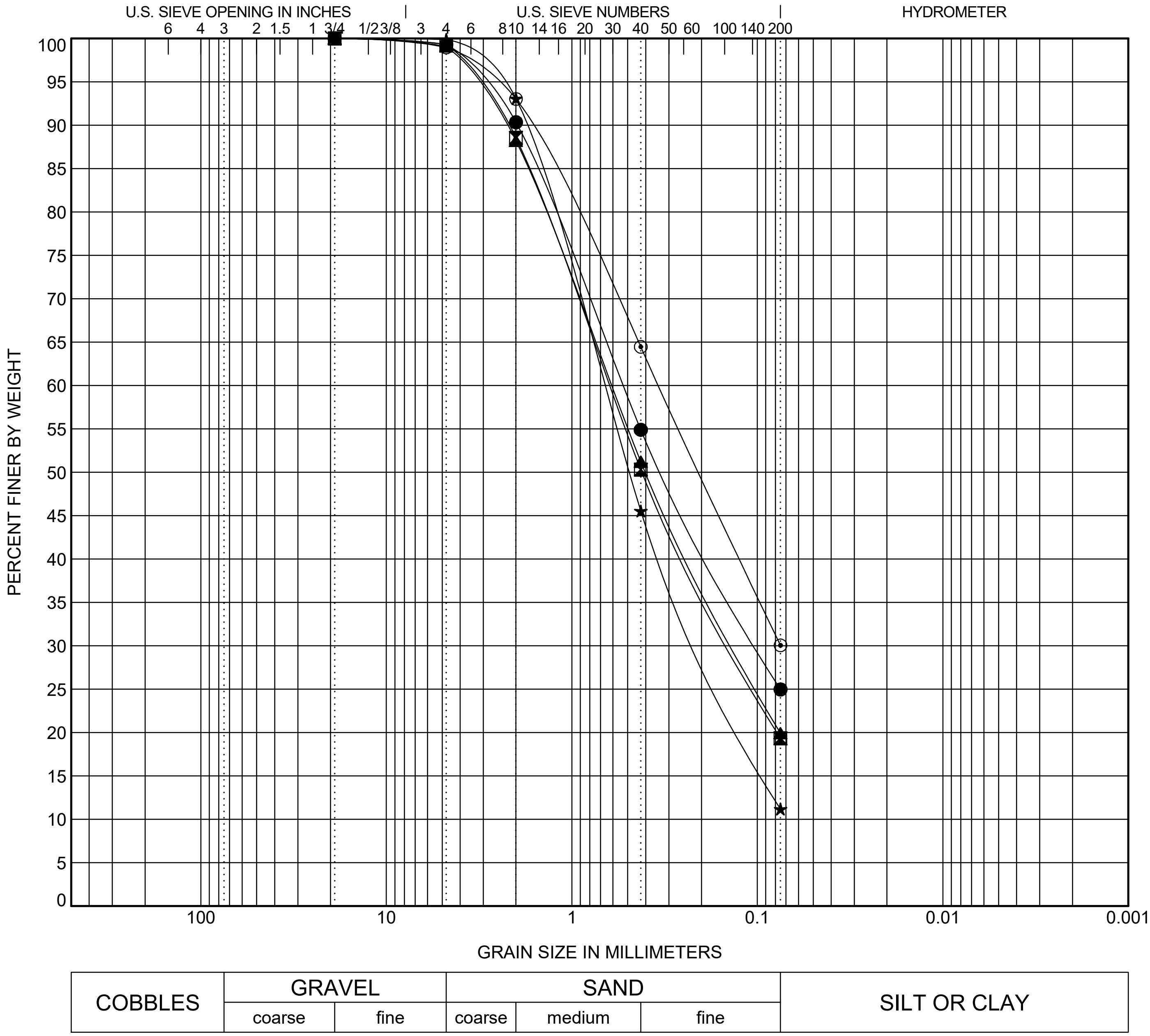
Analytical Testing: One sample was selected and transported to AP Engineering and Testing in Pomona, California to evaluate the concentration of soluble sulfates and chlorides, pH level, and resistivity of and within the on-site soils. The test results are shown on Figure No. B-11.

Expansion Index: Two samples were selected for expansion index testing in accordance with ASTM D4829. This test provides information regarding the expansive characteristics of soil under standardized test conditions. The following table presents the results of this testing.

Sample Location	Sample Depth (ft)	Initial Dry Density (pcf)	Initial Moisture Content (%)	Expansion Index	Expansion Class
B-07	0.0 – 4.5	104.1	9.0	22	Low
B-08	4.0 – 9.8	111.0	9.6	39	Low

Sand Equivalent: Six subgrade soil samples were selected for sand equivalent testing in accordance with ASTM D2419. This test is used to indicate the relative proportions of clay-size or plastic fines and dust in granular soil and fine aggregate. Sand equivalent test results are shown in the following table.

Sample Location	Sample Depth	SE
B-01	2.0-4.5	26
B-01	4.5-10.0	28
B-03	2.8-8.0	29
B-04	1.3-8.0	46
B-05	0.3-4.0	23
B-06	0.4-7.0	24



	SAMPLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-01**	**2.0**	**SILTY SAND (SM)**					
⧗	**B-01**	**4.5**	**SILTY SAND (SM)**	**26**	**25**	**1**		
▲	**B-03**	**2.8**	**SILTY SAND (SM)**	**NP**	**NP**	**NP**		
★	**B-04**	**1.3**	**POORLY GRADED SAND with SILT (SP-SM)**				**0.78**	**9.64**
⊙	**B-05**	**0.3**	**SILTY SAND (SM)**	**NP**	**NP**	**NP**		

	BOREHOLE	DEPTH	D100	D90	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-01**	**2.0**	**19**	**1.971**	**0.32**		**0.7**	**74.3**	**25.0**	
⧗	**B-01**	**4.5**	**19**	**2.248**	**0.418**		**0.7**	**80.0**	**19.3**	
▲	**B-03**	**2.8**	**19**	**2.308**	**0.397**		**0.9**	**79.1**	**19.9**	
★	**B-04**	**1.3**	**19**	**1.81**	**0.492**		**0.1**	**88.7**	**11.2**	
⊙	**B-05**	**0.3**	**19**	**1.698**	**0.205**		**1.0**	**68.9**	**30.0**	

GRADATION CURVES (ASTM D6913, ASTM D4318)

INLAND FOUNDATION ENGINEERING, INC.

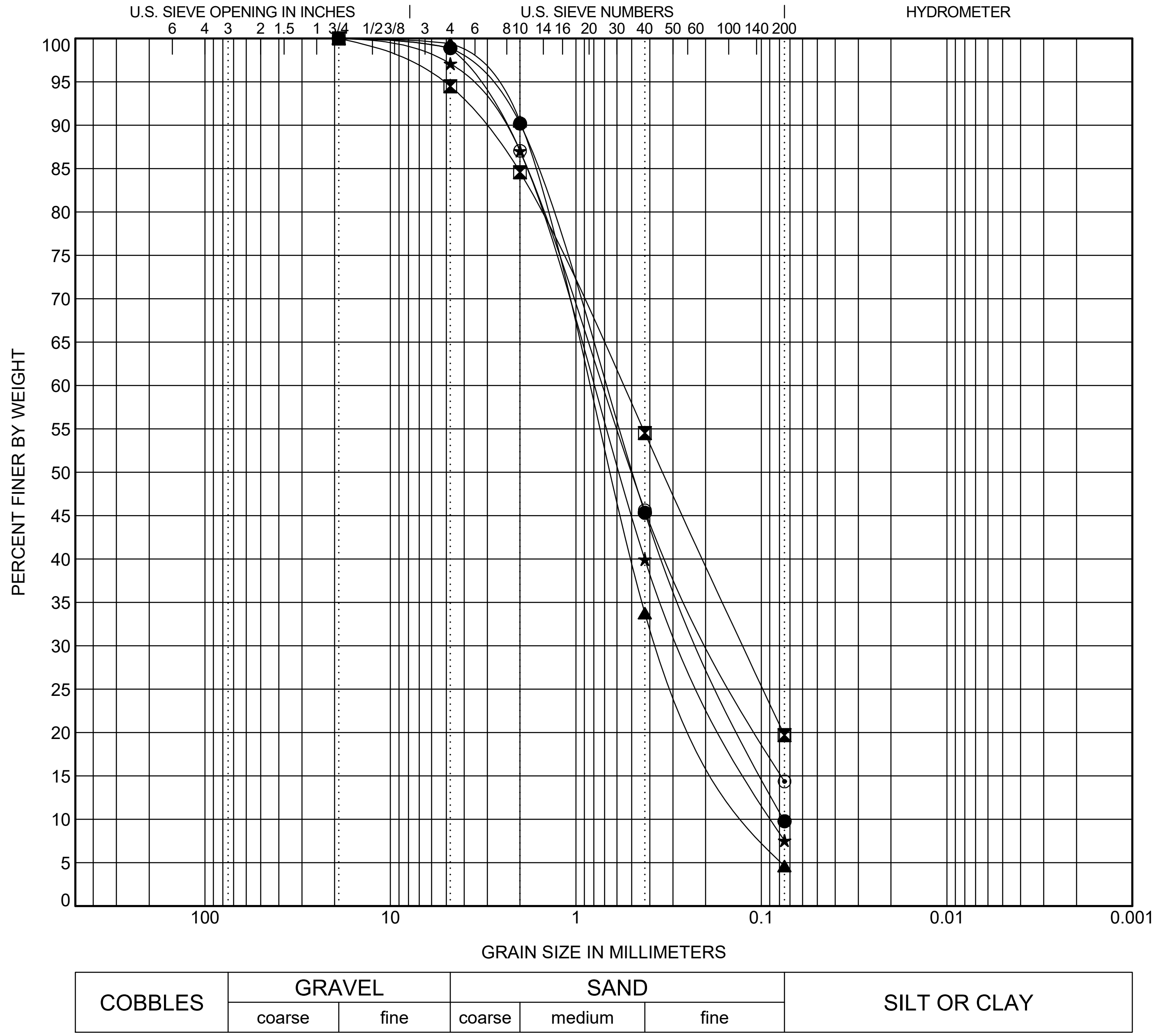
FIGURE NO. B-3

CLIENT Ardurra Group, Inc.

PROJECT NUMBER A319-002

PROJECT NAME Mission Canyon II Booster Pump Station

PROJECT LOCATION Gibbel Road, Hemet Area
Riverside County, CA



	SAMPLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-05**	**4.0**	**POORLY GRADED SAND with SILT (SP-SM)**				**0.76**	**9.30**
⧗	**B-06**	**0.4**	**SILTY SAND (SM)**	**NP**	**NP**	**NP**		
▲	**B-07**	**0.0**	**WELL GRADED SAND (SW)**	**NP**	**NP**	**NP**	**1.28**	**8.42**
★	**B-07**	**4.5**	**POORLY GRADED SAND with SILT (SP-SM)**				**0.89**	**9.61**
⊙	**B-07**	**11.8**	**SILTY SAND (SM)**					

	BOREHOLE	DEPTH	D100	D90	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-05**	**4.0**	**19**	**1.987**	**0.499**	**0.076**	**1.1**	**89.1**	**9.8**	
⧗	**B-06**	**0.4**	**19**	**3.21**	**0.339**		**5.5**	**74.8**	**19.7**	
▲	**B-07**	**0.0**	**19**	**1.976**	**0.663**	**0.103**	**0.6**	**94.8**	**4.6**	
★	**B-07**	**4.5**	**19**	**2.582**	**0.592**	**0.086**	**2.9**	**89.6**	**7.5**	
⊙	**B-07**	**11.8**	**19**	**2.482**	**0.501**		**1.1**	**84.5**	**14.4**	

GRADATION CURVES (ASTM D6913, ASTM D4318)

INLAND FOUNDATION ENGINEERING, INC.

FIGURE NO. B-4

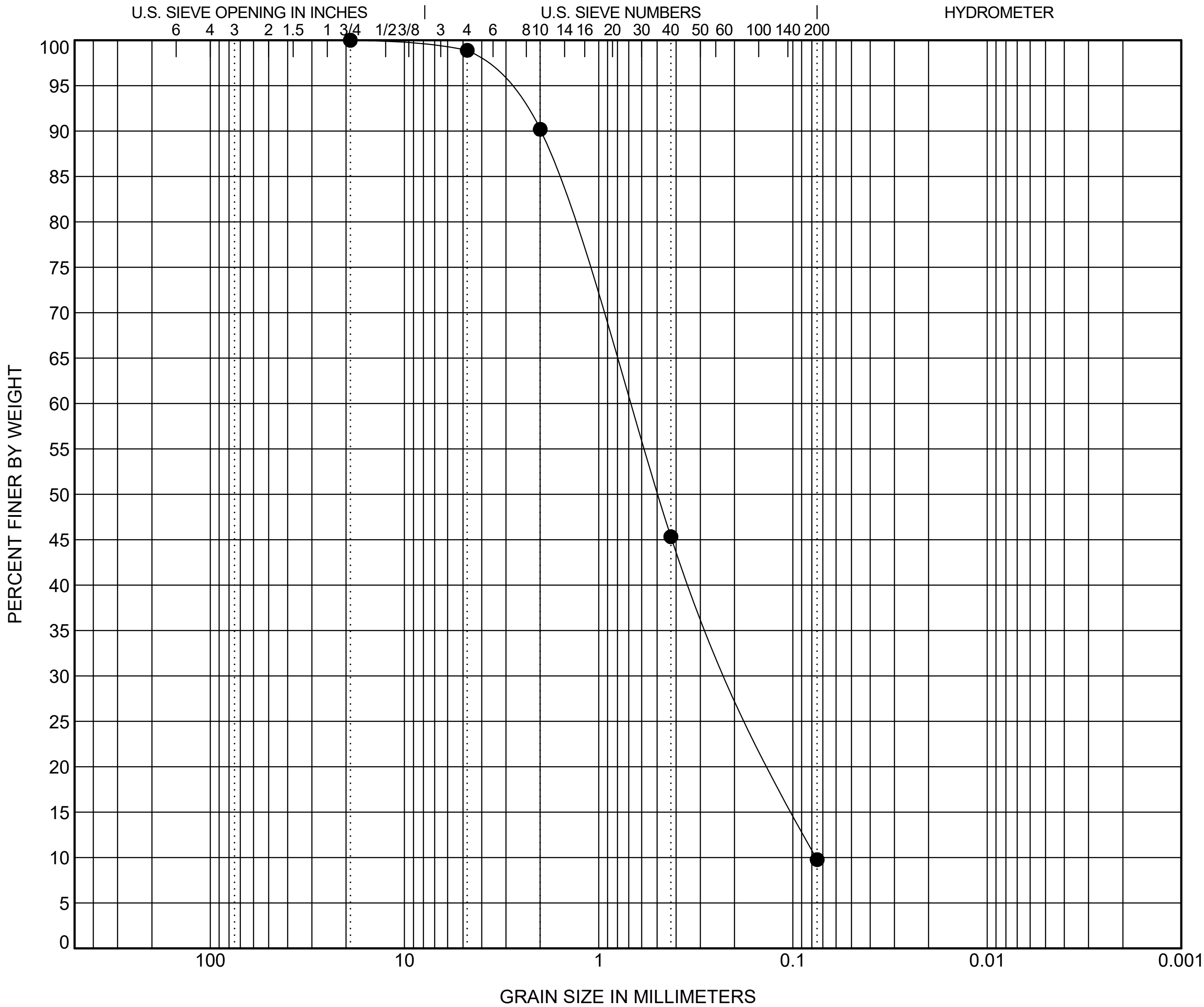
CLIENT Ardurra Group, Inc.

PROJECT NAME Mission Canyon II Booster Pump Station

PROJECT NUMBER A319-002

PROJECT LOCATION Gibbel Road, Hemet Area
Riverside County, CA

IFE SIEVE ANALYSIS - GINT STD US LAB.GDT - 9/6/23 16:27 - P:\A319\002\GINT.GPJ



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	SAMPLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-08**	**4.0**	**POORLY GRADED SAND with SILT (SP-SM)**	**NP**	**NP**	**NP**	**0.76**	**9.30**

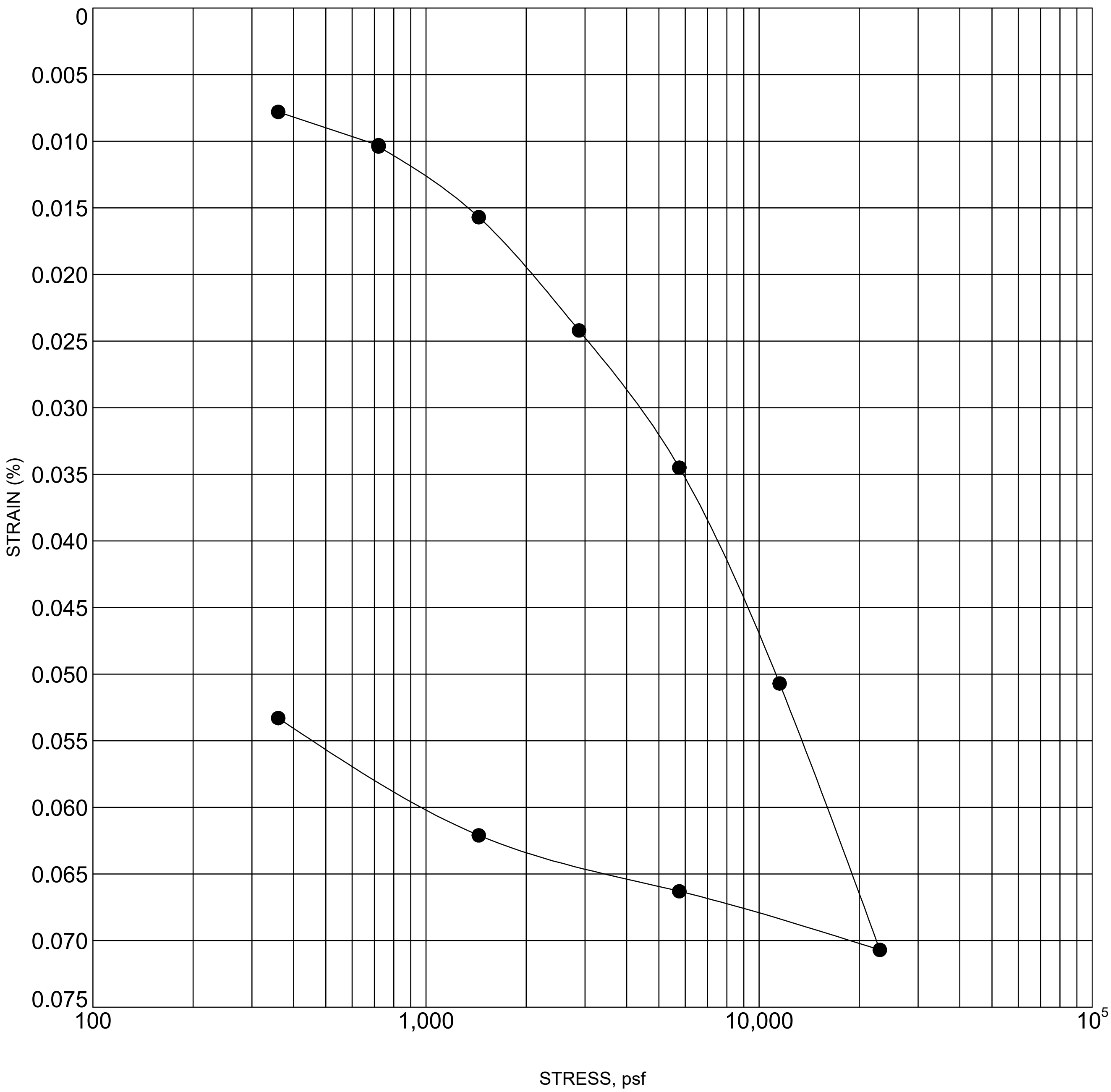
	BOREHOLE	DEPTH	D100	D90	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-08**	**4.0**	**19**	**1.987**	**0.499**	**0.076**	**1.1**	**89.1**	**9.8**	

GRADATION CURVES (ASTM D6913, ASTM D4318)

INLAND FOUNDATION ENGINEERING, INC.

FIGURE NO. B-5

CLIENT Ardurra Group, Inc.
PROJECT NUMBER A319-002
PROJECT NAME Mission Canyon II Booster Pump Station
PROJECT LOCATION Gibbel Road, Hemet Area
Riverside County, CA



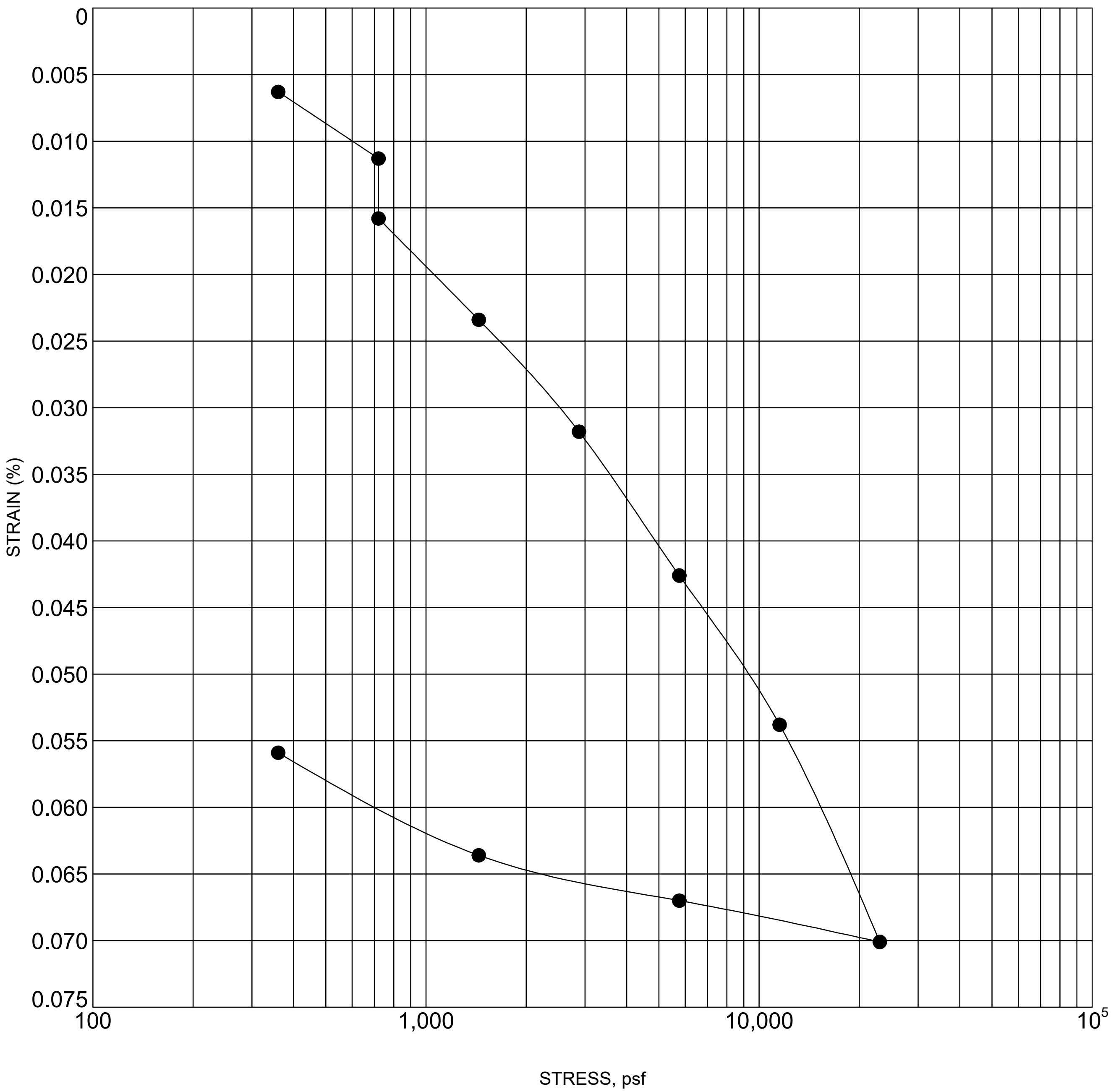
	BOREHOLE	DEPTH	Classification	γ_d	MC%
●	**B-07**	**8.0**	**SILTY SAND (SM)**		

CONSOLIDATION TEST (ASTM D2435)

FIGURE NO. B-6

INLAND FOUNDATION ENGINEERING, INC.

CLIENT Ardurra Group, Inc.
PROJECT NAME Mission Canyon II Booster Pump Station
PROJECT NUMBER A319-002
PROJECT LOCATION Gibbel Road, Hemet Area
Riverside County, CA



	BOREHOLE	DEPTH	Classification	γ_d	MC%
●	**B-08**	**6.5**	**POORLY GRADED SAND with SILT (SP-SM)**		

CONSOLIDATION TEST (ASTM D2435)

INLAND FOUNDATION ENGINEERING, INC.

FIGURE NO. B-7

CLIENT Ardurra Group, Inc.

PROJECT NAME Mission Canyon II Booster Pump Station

PROJECT NUMBER A319-002

PROJECT LOCATION Gibbel Road, Hemet Area
Riverside County, CA

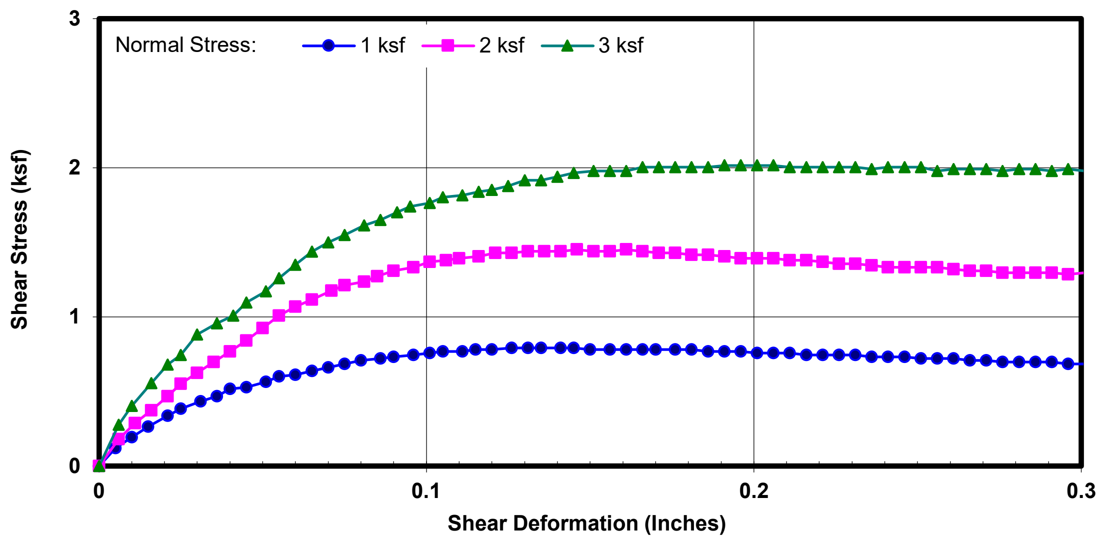
AP Engineering and Testing, Inc.
DBE|MBE|SBE
2607 Pomona Boulevard | Pomona, CA 91768
t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com

DIRECT SHEAR TEST RESULTS
ASTM D 3080

Project Name: Ardurra - Gibbel Road
Project No.: A319-002
Boring No.: B-3
Sample No.: - **Depth (ft):** 4.5-5.5
Sample Type: Mod. Cal.
Soil Description: Silty Sand
Test Condition: Inundated **Shear Type:** Regular

Tested By: AP **Date:** 08/01/23
Computed By: JP **Date:** 08/02/23
Checked by: AP **Date:** 08/02/23

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
113.7	110.4	3.0	17.2	15	88	1	0.792	0.684
						2	1.452	1.296
						3	2.016	1.978



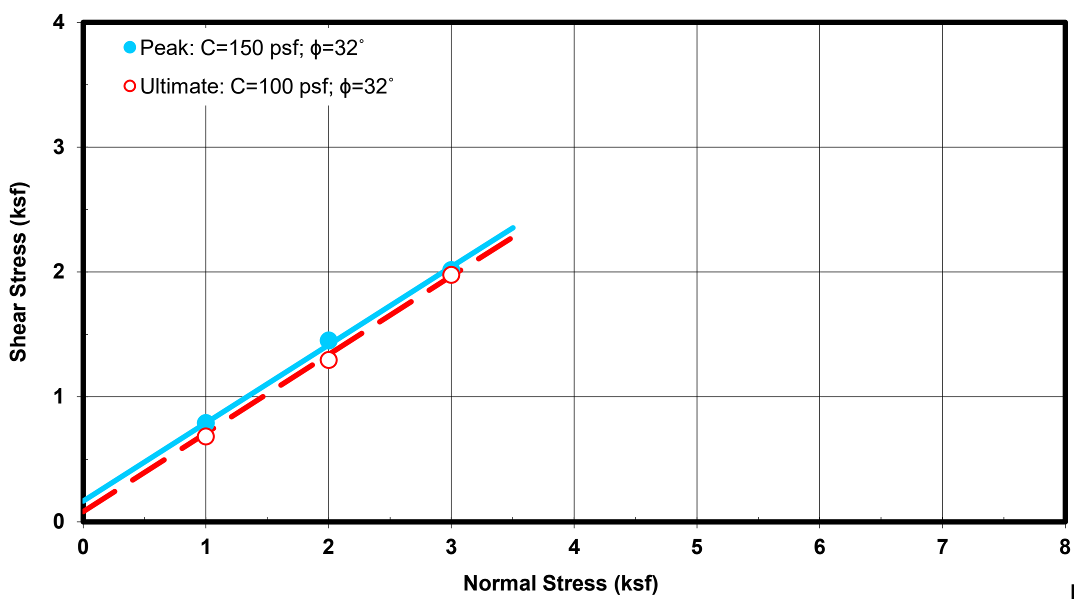


Figure No. B-8

AP Engineering and Testing, Inc.
DBE|MBE|SBE
2607 Pomona Boulevard | Pomona, CA 91768
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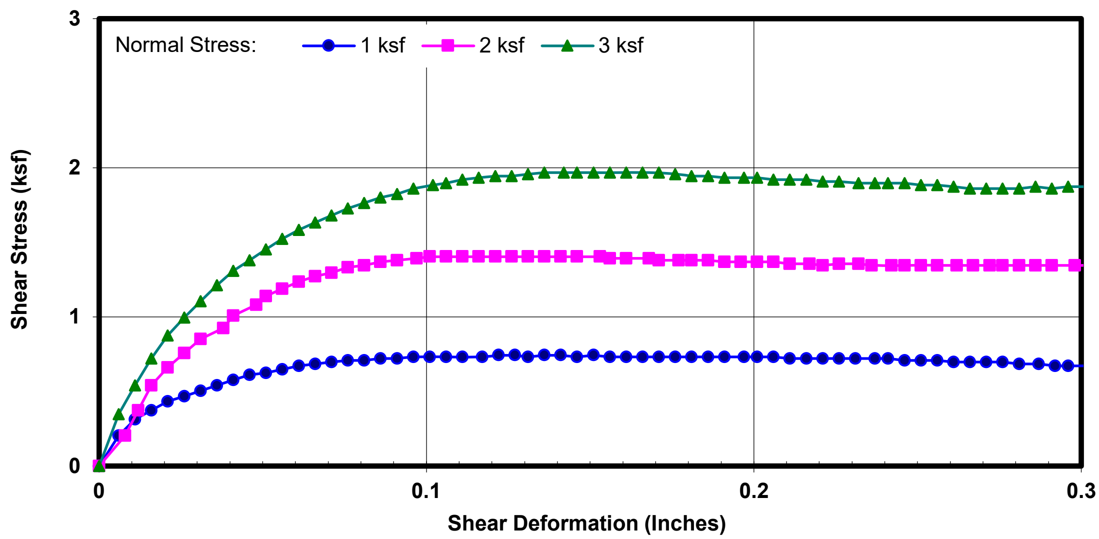
DIRECT SHEAR TEST RESULTS
ASTM D 3080

Project Name:	Ardurra - Gibbel Road	**Tested By:** AP	**Date:** 08/01/23
Project No.:	A319-002	**Computed By:** JP	**Date:** 08/02/23
Boring No.:	B-5	**Checked by:** AP	**Date:** 08/02/23
Sample No.:	-	**Depth (ft):** 1.5-2.5	
Sample Type:	Mod. Cal.		
Soil Description:	Silty Sand		
Test Condition:	Inundated	**Shear Type:** Regular	

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
114.5	112.5	1.8	16.6	10	90	1	0.744	0.672
						2	1.404	1.344
						3	1.968	1.872



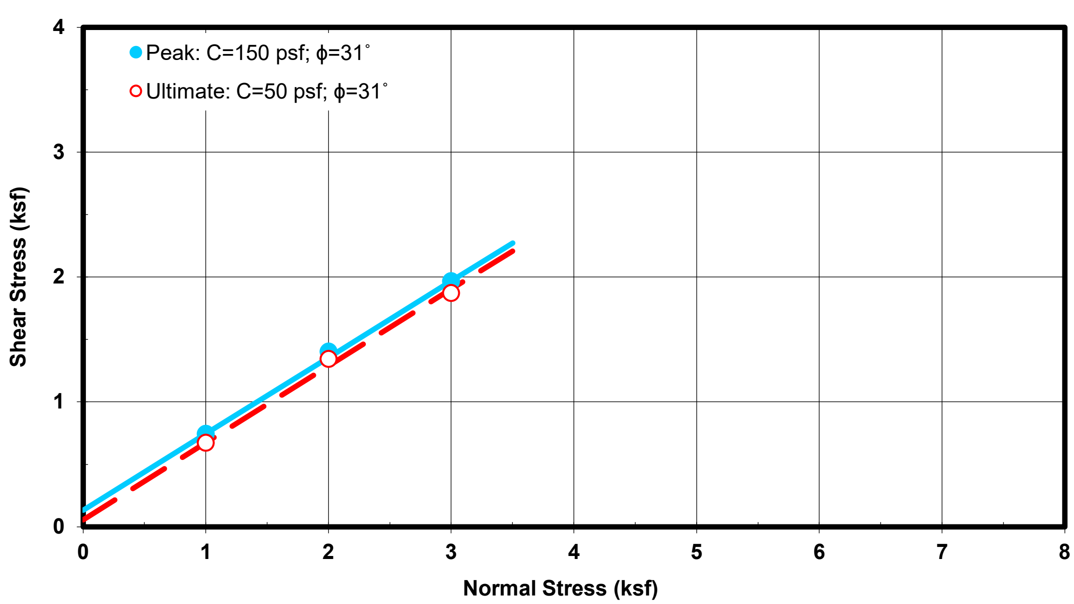


Figure No. B-9

AP Engineering and Testing, Inc.
DBE|MBE|SBE
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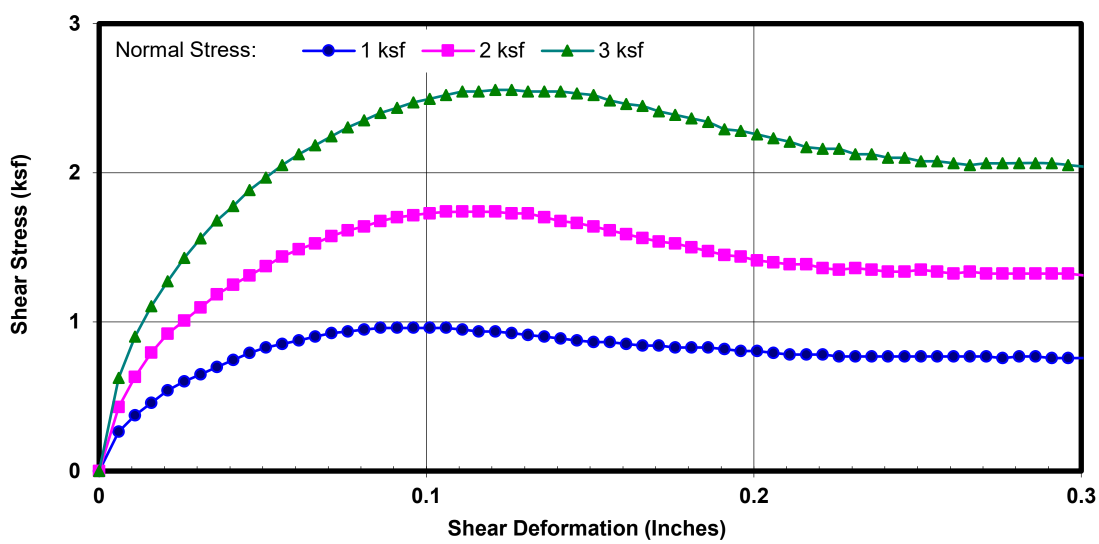
DIRECT SHEAR TEST RESULTS
ASTM D 3080

Project Name: Ardurra - Gibbel Road
Project No.: A319-002
Boring No.: B-7
Sample No.: - **Depth (ft):** 5.5-6.5
Sample Type: Mod. Cal.
Soil Description: Silty Sand
Test Condition: Inundated **Shear Type:** Regular

Tested By: AP **Date:** 08/01/23
Computed By: JP **Date:** 08/02/23
Checked by: AP **Date:** 08/02/23

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
111.1	98.6	12.7	23.3	48	89	1	0.960	0.756
						2	1.739	1.310
						3	2.556	2.040



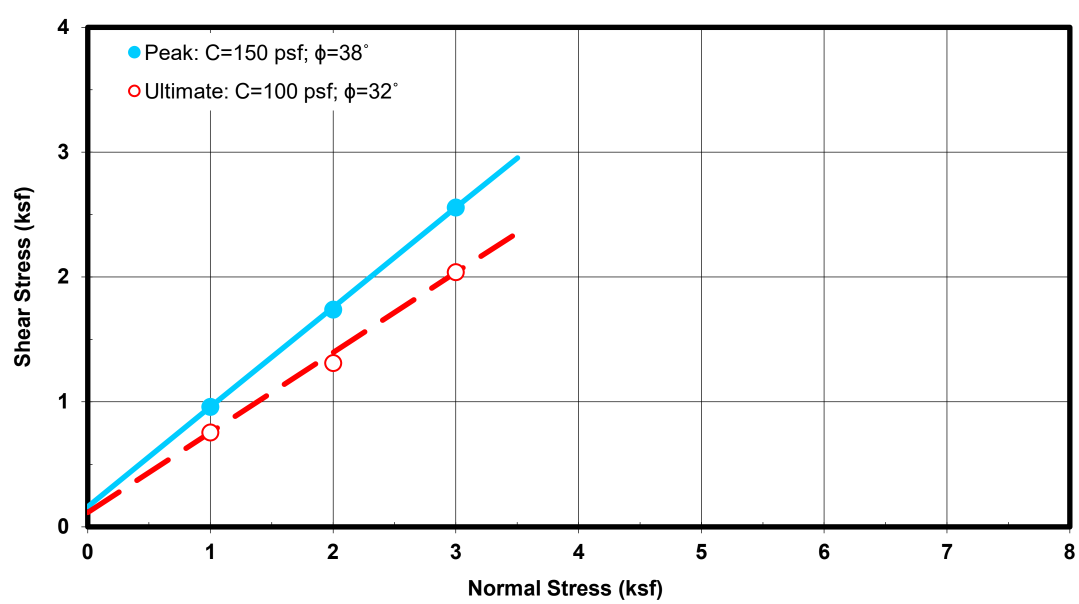


Figure No. B-10

CORROSION TEST RESULTS

Client Name: Inland Foundation Engineering
Project Name: Ardurra - Gibbel Road
Project No.: A319-002

AP Job No.: 23-0745
Date: 08/01/23

Boring No.	Sample No.	Depth (feet)	Soil Description	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
B-07	-	0-4.5	Sand w/silt	31,015	7.9	19	18

NOTES:
Resistivity Test and pH: California Test Method 643
Sulfate Content : California Test Method 417
Chloride Content : California Test Method 422
ND = Not Detectable
NA = Not Sufficient Sample
NR = Not Requested

APPENDIX C –
Liquefaction & Seismic Settlement Analysis

APPENDIX C

LIQUEFACTION AND SEISMIC SETTLEMENT ANALYSIS

Liquefaction and seismic settlement potential were evaluated using the GeoSuite® computer program (version 3.2.1.6). The seismic parameters included a horizontal acceleration of 1.01g and a moment magnitude of 7.80. We analyzed the soil profile logged for exploratory boring B-07. Liquefaction settlement analysis was based on the simplified procedures developed by Seed and Idriss and modified by Idriss and Boulanger (2008). The GeoSuite® program calculates corrected normalized SPT N-values $(N_1)_{60}$ using the following formula (SCEC, 1999).

$$(N_1)_{60} = N_M C_N C_E C_B C_R C_S$$

Where; N_M = measured standard penetration resistance. Modified California sample blowcounts were converted to SPT blowcounts using Burmister's formula (1948) prior to input in the program. The modified California sample blowcounts were also corrected to account for lined samplers, as described in the C_S factor discussion below.

C_N = depth correction factor. GeoSuite® calculates C_N for each layer in the soil profile using the relationship suggested by Idriss and Boulanger (2008)

C_E = hammer energy ratio (ER) correction factor. A C_E factor of 1.3 was applied for the automatic trip hammer used during drilling. This was calculated using the relationship suggested by Idriss and Boulanger (2008) and SPT hammer energy measurements provided by the drilling subcontractor.

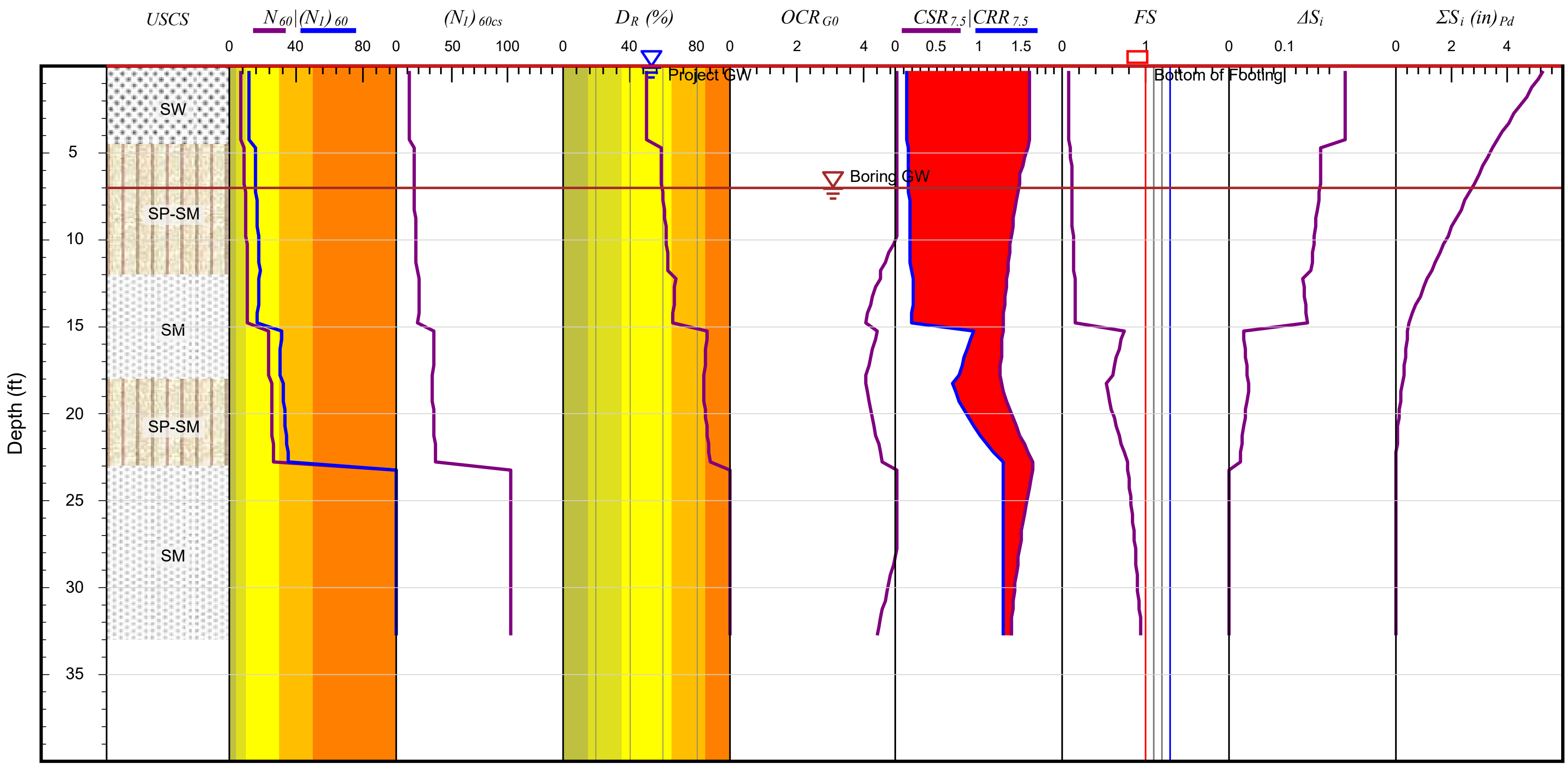
C_B = borehole diameter correction factor. A C_B factor of 1.0 was applied for the 8-inch diameter hollow-stem augers with inside diameters of four (4) inches (SCEC 1999).

C_R = rod length correction factor. GeoSuite® applies a C_R factor for each layer in the soil profile using the values in Table 5.2 of the 1999 SCEC guidelines, and assuming a rod stick up length (above the ground surface) of 3 feet.

C_S = correction factor for samplers with or without liners. SPT samplers without liners were used for this project. For SPT samplers without liners, GeoSuite® applies a C_S factor for each layer in the soil profile using the relationships from Seed et al. (1984) and suggested by Idriss and Boulanger (2008). Since GeoSuite® applies a C_S factor to all layers in the soil profile, it is necessary to adjust blowcounts for modified California samplers with liners.

This was done through an iterative process by initially dividing the modified California sampler blowcounts by an assumed C_S value of 1.2 prior to input in the program. Calculated C_S values were then checked against the assumed values and adjusted where necessary, so that the actual applied C_S value for modified California samples is 1.0.

The results of the analysis are shown on Figure No. C-3.



SW

SP-SM

SM

Silt Correction:
$K=(1-FC)^{0.75}$

Earthquake & Groundwater Information:
Magnitude = 7.8
Max. Acceleration = 1.01 g
Project GW = 0 ft
Maximum Settlement = 5.30 in
Settl. at Bottom of Footing = 5.30 in

Liquefaction: Idriss & Boulanger (2008)
Settl.: [dry] Pradel (1998); [sat]
Lateral spreading:
M correction: [Sand] Boulanger & Idriss(2004)
σv correction: Idriss & Boulanger (2008)
Stress reduction: Idriss & Boulanger (2008)

P:\A319\002\GeoSuite_A319-002_B-07.csv

IFE

Liquefaction Potential - SPT Data

Project:	Mission Canyon II Booster Pump Station		
Location:	Riverside County, California		
Project No.:	A319-002	Boring No.:	B-07
Figure:	C-3		

APPENDIX D –
Seismic Refraction Survey

TERRA GEOSCIENCES

SEISMIC REFRACTION SURVEY

ARDURRA MISSION CANYON II PROJECT

GIBBEL ROAD AREA

HEMET, RIVERSIDE COUNTY, CALIFORNIA

Project No. 233961-1

July 10, 2023

Prepared for:

Inland Foundation Engineering, Inc.
1310 South Santa Fe Avenue
San Jacinto, CA 92583

Consulting Engineering Geology & Geophysics

P.O. Box 1090, Loma Linda, CA 92354 • 909 796-4667

Inland Foundation Engineering, Inc.
1310 South Santa Fe Avenue
San Jacinto, CA 92583

July 11, 2023
Project No. 233961-1

Attention: Mr. Allen Evans, P.E., G.E., Principal

Regarding: Seismic Refraction Survey
Ardurra Mission Canyon II Project
Gibbel Road Area
Hemet, Riverside County, California
IFE Project No. A310-002

EXECUTIVE SUMMARY

As requested, this firm has performed a geophysical survey using the seismic refraction method for the proposed booster pump station replacement project, as referenced above. The purpose of this investigation was to assess the general seismic velocity characteristics of the underlying earth materials and to evaluate whether high velocity bedrock materials (non-rippable) may be present. Additionally, the structure and seismic velocity distribution of the subsurface earth materials was also assessed. This report will describe in further detail the procedures used and the results of our findings, along with presentation of representative seismic models for the survey traverses.

For this study, two survey traverses (Seismic Lines S-1 and S-2) have been performed within the subject project area, as selected by your office. These traverses were located in the field by use of Google™ Earth imagery (2023) and GPS coordinates. The approximate locations of our seismic survey traverses are presented on a captured Google™ Earth (2023) image and appears as the Seismic Line Location Map, as shown on Plate 1.

This opportunity to be of service is sincerely appreciated. If you should have questions regarding this report or do not understand the limitations of this study or the data and results that are presented, please do not hesitate to contact our office.

Respectfully submitted,
TERRA GEOSCIENCES

Donn C. Schwartzkopf
Principal Geophysicist
PGP 1002

PROFESSIONAL GEOPHYSICIST
DONN C. SCHWARTZKOPF
No. 1002
STATE OF CALIFORNIA

TABLE OF CONTENTS

INTRODUCTION

The subject survey area is located along Gibbel Road, approximately two-miles east of State Street, in the Hemet area of Riverside County, California. More specifically, Seismic Line S-1 was performed within an open field just north of Gibbel Road and Seismic Line S-2 was performed along the southeastern shoulder of Gibbel Road. The approximate locations of these traverses are presented on a captured Google™ Earth (2023) image, as indicated on the Seismic Line Location Map, Plate 1.

Locally, the subject site is situated along some low-lying hills within the northwestern-most portion of the Santa Rosa Hills. Surficial geologic mapping by Morton and Matti (2005), as shown on Figure 1 below, indicate the subject study area to underlain by Cretaceous age granitic rocks, which consists of a heterogenous plutonic assemblage of mainly biotite hornblende and biotite tonalite (map symbol Kh). The northern survey traverse (Seismic Line S-1) was performed along a relatively flat-lying alluvial plain within Avery Canyon, while Seismic Line S-2 was performed along the shoulder of Gibbel Road where exposures of the bedrock are present in the local vicinity. The approximate locations of the survey traverses are shown as the circled blue lines below in Figure 1, for reference.

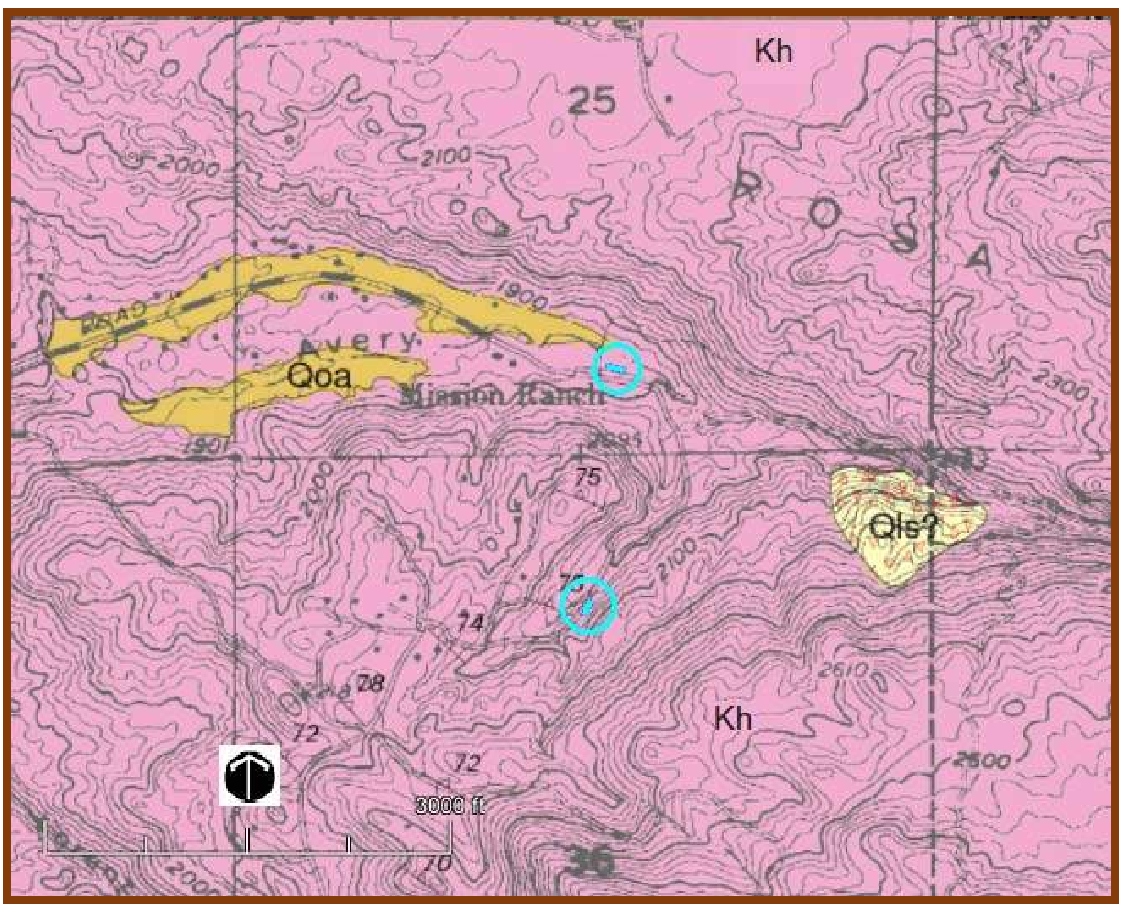


FIGURE 1- Geologic Map (Morton and Matti, 2005), survey traverses shown as blue lines.

SEISMIC REFRACTION SURVEY

Methodology

The seismic refraction method consists of measuring (at known points along the surface of the ground) the travel times of compressional waves generated by an impulsive energy source and can be used to estimate the layering, structure, and seismic acoustic velocities of subsurface horizons. Seismic waves travel down and through the soils and rocks, and when the wave encounters a contact between two earth materials having different velocities, some of the wave's energy travels along the contact at the velocity of the lower layer. The fundamental assumption is that each successively deeper layer has a velocity greater than the layer immediately above it. As the wave travels along the contact, some of the wave's energy is refracted toward the surface where it is detected by a series of motion-sensitive transducers (geophones). The arrival time of the seismic wave at the geophone locations can be related to the relative seismic velocities of the subsurface layers in feet per second (fps), which can then be used to aid in interpreting both the depth and type of materials encountered.

Field Procedures

Two seismic refraction survey lines (Seismic Lines S-1 and S-2) have been performed along the selected areas (See Seismic Line Location Map, Plate 1), which were located in the field by use of Google™ Earth imagery (2023) and GPS coordinates. Seismic Line S-1 was 150 feet in length, with Seismic Line S-2 being 125 feet in length. Each survey traverses consisted of a total of twenty-four 14-Hertz geophones, spaced at regular six-foot (Seismic Line S-1) and five-foot (Seismic Line S-2) intervals, in order to detect both the direct and refracted waves. To produce these seismic waves, a 16-pound sledge-hammer was used as the energy source.

Seven shot points were utilized along each spread using forward, reverse, and several intermediate locations in order to obtain high resolution survey data for velocity analysis and depth modeling purposes. Multiple hammer impacts were utilized at each shot point location in order to increase the signal to noise ratio, which enhanced the primary seismic “P”-waves. The seismic wave arrivals were digitally recorded in SEG-2 format on a Geometrics StrataVisor™ NZXP model signal enhancement refraction seismograph. The data was acquired using a sampling rate of 0.0625 milliseconds having a record length of 0.08 seconds. No acquisition filters were used during data collection.

During acquisition, the seismograph displays the seismic wave arrivals on the computer screen which were used to analyze the arrival time of the primary seismic “P”-waves at each geophone station, in the form of a wiggle trace for quality control purposes in the field. If spurious “noise” was observed, an attempt was made to resample the data during relatively quieter periods. Each geophone and seismic shot location were surveyed using a hand level and ruler for topographic correction, with “0” being the lowest point along each survey line.

Data Processing

The recorded seismic data was subsequently transferred to our office computer for processing and analyzing purposes, using the computer programs **SIPwin** (**S**eismic Refraction **I**nterpretation **P**rogram for **Win**dows) developed by Rimrock Geophysics, Inc. (2004); **Refractor** (Geogiga, 2001-2023); and **Rayfract™** (Intelligent Resources, Inc., 1996-2022). All of the computer programs perform their individual analyses using exactly the same input data, which includes the first-arrival times of the "P"-waves and the survey line geometry. These programs are briefly summarized below:

- **SIPwin** is a ray-trace modeling program that evaluates the subsurface using layer assignments based on time-distance curves and is better suited for layered media, using the "Seismic Refraction Modeling by Computer" method (Scott, 1973). The first step in the modeling procedure is to compute layer velocities by least-squares techniques. Then the program uses the delay-time method to estimate depths to the top of layer-2. A forward modeling routine traces rays from the shot points to each geophone that received a first-arrival ray refracted along the top of layer-2. The travel time of each such ray is compared with the travel time recorded in the field by the seismic system. The program then adjusts the layer-2 depths so as to minimize discrepancies between the computed ray-trace travel times and the first arrival times picked from the seismic waveform record. The process of ray tracing and model adjustment is repeated a total of six times to improve the accuracy of depths to the top of layer-2. This first-arrival picks were then used to generate the Layer Velocity Models using the **SIPwin** computer program, which presents the subsurface velocities as individual layers and are presented within Appendix A for reference. In addition, the associated Time-Distance Plot for each survey line, which shows the individual data picks of the first "P-wave" arrival times, also appears in Appendix A.

- **Refractor** is seismic refraction software that also evaluates the subsurface using layer assignments utilizing interactive and interchangeable analytical methods that include the Delay-Time method, the Plus-Minus method, and the Generalized Reciprocal Method (GRM). These methods are used for defining irregular non-planar refractors and are briefly described below.

    - The <u>Delay-Time</u> method will measure the delay time depth to a refractor beneath each geophone rather than at shot points. Delay-time is the time spent by a wave to travel up or down through the layer compared to the time the wave would spend if traveling along the projection of the slant path on the refractor.

    - The <u>Plus-Minus</u> time analysis method includes a Plus time analysis for depth analysis and a Minus time analysis for velocity determination. The basis of the Plus-Minus time analysis method lies in the traveltime reciprocity, i.e., the traveltime of a seismic wave from source to receiver is equal to the traveltime in the opposite direction if source and receiver are interchanged. It can be used to calculate the depth and velocity variations of an undulating layer boundary for slope angles less than ~10°.

- The GRM method is a technique for delineating undulating refractors at any depth from in-line seismic refraction data consisting of forward and reverse travel-times and is capable of resolving dips of up to 20% and does not over-smooth or average the subsurface refracting layers. In addition, the technique provides an approach for recognizing and compensating for hidden layer conditions.

- **Rayfract™** is seismic refraction tomography software that models subsurface refraction, transmission, and diffraction of acoustic waves which generally indicates the relative structure and velocity distribution of the subsurface using first break energy propagation modeling. An initial 1D gradient model is created using the DeltatV method (Gebrande and Miller, 1985) which gives a good initial fit between modeled and picked first breaks. The DeltatV method is a turning-ray inversion method which delivers continuous depth vs. velocity profiles for all profile stations. These profiles consist of horizontal inline offset, depth, and velocity triples. The method handles real-life geological conditions such as velocity gradients, linear increasing of velocity with depth, velocity inversions, pinched-out layers and outcrops, and faults and local velocity anomalies. This initial model is then refined automatically with a true 2D WET (Wavepath Eikonal Traveltime) tomographic inversion (Schuster and Quintus-Bosz, 1993).

  WET tomography models multiple signal propagation wave-paths contributing to one first break, whereas conventional ray tracing tomography is limited to the modeling of just one ray per first break. This computer program performs the analysis by using the same first-arrival P-wave times and survey line geometry that were generated during the layer velocity model analyses. The associated Refraction Tomographic Models, which display the subsurface earth material velocity structure, is represented by the velocity contours (isolines displayed in feet/second), supplemented with the color-coded velocity shading for visual reference, and are presented within Appendix B.

  The combined use of these computer programs provided a more thorough and comprehensive analysis of the subsurface structure and velocity characteristics. Each computer program has a specific purpose based on the objective of the analysis being performed. **SIPwin** and **Refractor** were primarily used for detecting generalized subsurface velocity layers and contact boundaries, providing "weighted average velocities."

  The processed seismic data of these two programs were compared and averaged to provide a final composite layer velocity model which provided a more thorough representation of the subsurface. **Rayfract™** provided tomographic velocity and structural imaging that is very conducive to detecting strong lateral velocity characteristics such as imaging corestones, dikes, and other subsurface structural characteristics.

SUMMARY OF GEOPHYSICAL INTERPRETATION

To begin our discussion, it is important to consider that the seismic velocities obtained within bedrock materials are influenced by the nature and character of the localized major structural discontinuities (foliation, fracturing, relic bedding, etc.), creating anisotropic conditions. Anisotropy (direction-dependent properties of materials) can be caused by "micro-cracks," jointing, foliation, layered or inter-bedded rocks with unequal layer stiffness, small-scale lithologic changes, etc. (Barton, 2007). Velocity anisotropy complicates interpretation and it should be noted that the seismic velocities obtained during this survey may have been influenced by the nature and character of any localized structural discontinuities within the bedrock underlying the subject site. Generally, it is expected that higher (truer) velocities will be obtained when the seismic waves propagate along direction (strike) of the dominant structure, with a damping effect when the seismic waves travel in a perpendicular direction. Such variable directions can result in velocity differentials of between 2% to 40% depending upon the degree of the structural fabric (i.e., weakly-moderately-strongly foliated, respectively). Therefore, the seismic velocities obtained during our field study and as discussed below, should be considered minimum velocities at this time.

The first computer method described below used for data analysis is the traditional layer method (**SIPwin** and **Refractor**). Using this method, it should be understood that the data obtained represents an average of seismic velocities within any given layer. For example, high seismic velocity boulders, dikes, or other local lithologic inconsistencies, may be isolated within a low velocity matrix, thus yielding an average medium velocity for that layer. Therefore, in any given layer, a range of velocities could be anticipated, which can also result in a wide range of excavation characteristics.

In general, the site where locally surveyed, was noted to be characterized by three major subsurface layers (Layers V1 through V3) with respect to seismic velocities. The following velocity layer summaries have been prepared using the **SIPwin** and **Refractor** analysis, with the representative Layer Velocity Models presented within Appendix A along with their respective Time-Distance Plots.

- **Velocity Layer V1**:

  This uppermost velocity layer (V1) is most likely comprised of alluvium, colluvium, topsoil, and/or completely-weathered and fractured bedrock materials. This layer has an average weighted velocity of 882 to 1,562 fps, which is typical for these types of unconsolidated surficial earth materials.

- **Velocity Layer V2**:

  The second layer (V2) yielded a seismic velocity of 3,393 fps, which is generally typical for highly-weathered granitic bedrock materials. This velocity range may indicate the presence of homogeneous weathered bedrock with a relatively wide spaced joint/fracture system and/or the possibility of buried relatively-fresher boulders within a very highly-weathered bedrock matrix.

- **Velocity Layer V3**:

  The third layer (V3) indicates the presence of slightly-weathered granitic bedrock, which has a seismic velocity of 8,136 to 9,521 fps. These higher velocities signify the decreasing effect of weathering as a function of depth and could indicate a slightly-weathered bedrock matrix that has a wide-spaced fracture system, or possibly the presence of abundant widely-scattered buried fresh large crystalline boulders (corestones) within a relatively less-weathered bedrock matrix.

The following table summarizes the results of the survey lines with respect to the "weighted average" seismic velocities for each layer, as indicated on the Layer Velocity Models, presented within Appendix A.

TABLE 1- VELOCITY SUMMARY OF SEISMIC SURVEY LINES

Seismic Line	V1 Layer (fps)	V2 Layer (fps)	V3 Layer (fps)
S-1	**882**	**-----**	**9,521**
S-2	**1,562**	**3,393**	**8,136**

Using **Rayfract™**, tomographic models were also prepared for comparative purposes to better illustrate the general structure and velocity distribution of the subsurface, using velocity contour isolines, as presented within Appendix B. Although no discrete velocity layers or boundaries are created, these models generally resemble the corresponding overall average layer velocities as presented within Appendix A.

In general, the seismic velocity of the underlying materials gradually increases with depth, with occasional lateral velocity differentials suggesting the local presence of buried corestones, lithologic variabilities, and/or dike structures. The colors representing the velocity gradients have been standardized on both of the models for comparative purposes.

GENERALIZED RIPPABILITY CHARACTERISTICS OF BEDROCK

A summary of the generalized rippability characteristics of bedrock, based on a compilation of rippability performance charts prepared by Caterpillar, Inc. (2019; see Figure 2, Page 8), Caltrans (Stephens, 1978), and Santi (2006), has been provided to aid in evaluating potential excavation difficulties with respect to the seismic velocities obtained along the local areas surveyed. These seismic velocity ranges and rippability potentials have been tabulated below for reference.

TABLE 2- CATERPILLAR RIPPABILITY CHART (D9 Ripper)

Granitic Rock Velocity	Rippability
< 6,800	Rippable
6,800 – 8,000	Moderately Rippable
> 8,000	Non-Rippable

Additionally, the Caltrans Rippability Chart is presented below within Table 3 for comparison. These values are from published Caltrans studies (Stephens, 1978) that are based on their experience and appear to be more conservative than Caterpillar's rippability chart. It should be noted that the type of bedrock was not indicated.

TABLE 3- STANDARD CALTRANS RIPPABILITY CHART

Velocity (feet/sec ±)	Rippability
< 3,500	Easily Ripped
3,500 – 5,000	Moderately Difficult
5,000 – 6,600	Difficult Ripping / Light Blasting
> 6,600	Blasting Required

Table 4 is partially modified from the "Engineering Behavior from Weathering Grade" as presented by Santi (2006), which also provides velocity ranges with respect to rippability potentials, along with other rock engineering properties that may be pertinent.

TABLE 4- SUMMARY OF ROCK ENGINEERING PROPERTIES

ENGINEERING PROPERTY:	Slightly Weathered	Moderately Weathered	Highly Weathered	Completely Weathered
Excavatability	Blasting necessary	Blasting to rippable	Generally rippable	Rippable
Slope Stability	½ :1 to 1:1 (H:V)	1:1 (H:V)	1:1 to 1.5:1 (H:V)	1.5:1 to 2:1 (H:V)
Schmidt Hammer Value	51 – 56	37 – 48	12 – 21	5 – 20
Seismic Velocity (fps)	8,200 – 13,125	5,000 – 10,000	3,300 – 6,600	1,650 – 3,300

The rippability performance chart prepared by Caterpillar, Inc. (2019) has been provided as Figure 2 below for reference, based on a D9R/D9T dozer. This chart has been prepared for conventional bulldozer equipment and cannot be directly correlated with trenching equipment such as most-likely to be used at the subject site for the proposed pipeline portion of the subject project. Currently, there are no published performance charts available that compare rippability potentials versus seismic velocity for excavator-type equipment. Trenching operations, of which this project will most likely employ, utilize large excavator-type equipment. These excavators typically encounter very difficult to non-productable conditions within granitic bedrock materials where seismic velocities are generally greater than 4,000± fps, with less production where smaller backhoe-type equipment is used.

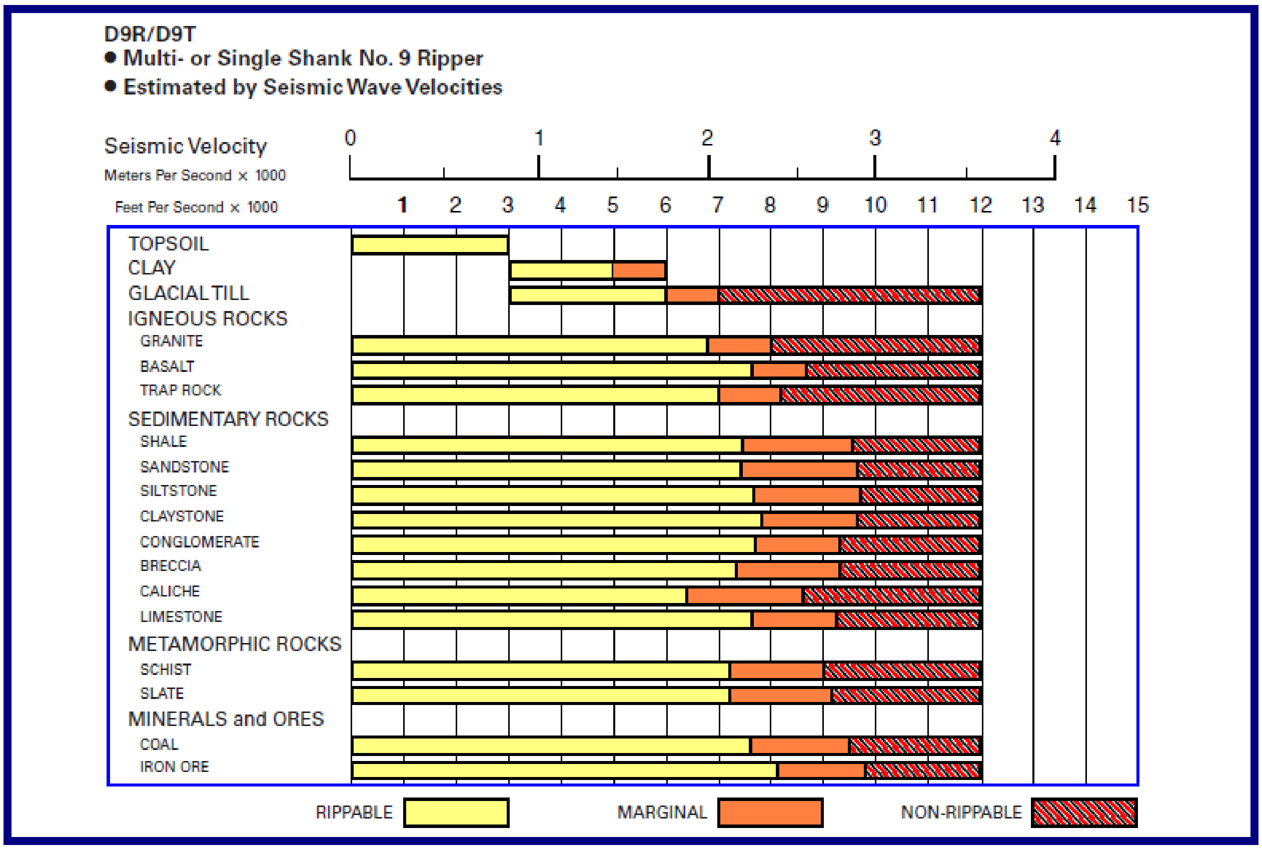


FIGURE 2- Caterpillar D9R Ripper Performance Chart (2019).

For purposes of the discussion in this report with respect to the expected bedrock rippability characteristics, we are assuming that a D9R/D9T dozer will be used as a minimum, such as discussed further below and as shown in Figure 2 above. Smaller excavating equipment will most likely result in slower production rates and possible refusal within relatively lower velocity bedrock materials. *It should be noted that the decision for blasting of bedrock materials for facilitating the excavation process is sometimes made based upon economic production reasons and not solely on the rippability (velocity/hardness) characteristics of the bedrock*.

A summary of the generalized rippability characteristics of granitic bedrock has been provided below to aid in evaluating potential excavation difficulties with respect to the seismic velocities that were obtained along the local areas surveyed. The velocity ranges described below are general averages of Tables 2 and 3 presented in this report (see Page 7) and assume typical, good-working, heavy excavation equipment, such as D9R dozer using a single shank, as described by Caterpillar, Inc. (2000 and 2019) and as graphically indicated above in Figure 2.

These average seismic velocity ranges are summarized below:

- <u>**Rippable Condition (0 - 4,000 ft/sec)**</u>:

  This velocity range indicates rippable materials which may consist of alluvial-type deposits and decomposed granitic bedrock, with random hardrock floaters. These materials typically break down into silty sands (depending on parent lithologic materials), whereas floaters will require special disposal. Some areas containing numerous hardrock floaters may present utility trench problems. Large floaters exposed at or near finished grade may present problems for footing or infrastructure trenching.

- <u>**Marginally Rippable Condition (4,000 - 7,000 ft/sec)**</u>

  This range of seismic velocities indicates materials which may consist of moderately weathered bedrock and/or large areas of fresh bedrock materials separated by weathered fractured zones. These bedrock materials are generally rippable with difficulty by a Caterpillar D9R or equivalent. Excavations may produce material that will partially break down into a coarse silty to clean sand, with a high percentage of very coarse sand to pebble-sized material depending on the parent bedrock lithology. Less fractured or weathered materials will probably require blasting to facilitate removal.

- <u>**Non-Rippable Condition (7,000 ft/sec or greater)**</u>:

  This velocity range includes non-rippable material consisting primarily of moderately fractured bedrock at lower velocities and only slightly fractured or unfractured rock at higher velocities. Materials in this velocity range may be marginally rippable, depending upon the degree of fracturing and the skill and experience of the operator. Tooth penetration is often the key to ripping success, regardless of seismic velocity. If the fractures and joints do not allow tooth penetration, the material may not be ripped effectively; however, pre-blasting or "popping" may induce sufficient fracturing to permit tooth entry. In their natural state, materials with these velocities are generally not desirable for building pad grade, due to difficulty in footing and utility trench excavation. Blasting will most likely produce oversized material, requiring special disposal.

GEOLOGIC & EARTHWORK CONSIDERATIONS

To evaluate whether a particular bedrock material can be ripped or excavated, this geophysical survey should be used in conjunction with the geologic and/or geotechnical report and/or information gathered for the subject project which may describe the physical properties of the bedrock. The physical characteristics of bedrock materials that favor ripping generally include the presence of fractures, faults, and other structural discontinuities, weathering effects, brittleness or crystalline structure, stratification or lamination, large grain size, moisture permeated clay, and low compressive strength. If the bedrock is foliated and/or fractured at depth, this structure could aid in excavation production. Unfavorable bedrock conditions can include such characteristics as massive and homogeneous formations, non-crystalline structure, absence of planes of weakness, fine-grained materials, and formations of clay origin where moisture makes the material plastic. Use of these physical bedrock conditions along with the subsurface velocity characteristics as presented within this report should aid in properly evaluating the type of equipment that will be necessary and the production levels that can be anticipated for this project.

A summary of excavation considerations is included within Appendix C in order to provide you and your grading contractor with a better understanding of the complexities of excavation in bedrock materials, so that proper planning and excavation techniques can be employed.

SUMMARY OF FINDINGS AND CONCLUSIONS

The raw field data was considered to be of good quality with very little ambient "noise" that was introduced during our survey. This minor "noise" may have originated from distant vehicular traffic along the nearby roadways, overhead aircraft, and possibly some high-frequency communications from neighboring cell and microwave towers. Analysis of the data and picking of the primary "P"-wave arrivals was therefore performed with very little difficulty, with some interpolation of some data points being necessary.

Based on the results of our comparative seismic analyses of the computer programs **SIPwin**, **Refractor**, and **Rayfract™**, the seismic refraction survey line models appear to generally coincide with one another, with some minor variances due to the methods that these programs process, integrate, and display the input data. The anticipated excavation potentials of the velocity layers encountered locally during our survey are as follows:

- ***<u>Velocity Layer V1</u>***:

  No excavating difficulties are expected to be encountered within the uppermost, low-velocity V1 layer (average weighted velocity of 882 to 1,562 fps) and should excavate with conventional ripping. This surficial velocity layer is expected to be comprised of alluvium along Seismic Line S-1 and topsoil, colluvium, and/or completely-weathered and fractured bedrock materials along Seismic Line S-2. Localized boulders could be anticipated within this layer based on the surficial outcrops within the general area.

- **Velocity Layer V2**:

  The second V2 layer that was encountered along Seismic Line S-2 (average weighted velocity of 3,393 fps) is believed to consist of highly-weathered granitic bedrock materials. Using the rippability classifications as presented within Tables 2 through 4 and Figure 2, seismic wave velocities of less than 6,600 to 6,800± fps are generally noted to be within the threshold for conventional ripping. Isolated floaters (i.e., boulders, corestones, etc.) are most likely present within the bedrock and could produce somewhat difficult conditions locally. Although not highly anticipated, trenching and/or placement of infrastructure within this seismic velocity layer using excavator equipment, may require some breaking and/or light blasting to obtain desired grade.

- **Velocity Layer V3**:

  The third V3 layer is believed to consist of slightly-weathered bedrock, with some fresher rock locally at depth. Hard to very hard excavation difficulties within this velocity layer (average weighted velocity range of 8,136 to 9,521 fps) should be anticipated if encountered during grading. This layer may consist of relatively homogeneous bedrock with wide-spaced fracturing, or may contain higher velocity scattered corestones, dikes, and other lithologic variables, within a relatively lower velocity bedrock matrix. Caterpillar (2019; see Figure 2) indicates this velocity range to be “non-rippable” using a D9R dozer or equivalent. Larger equipment may facilitate excavation potentials within this higher velocity layer. Blasting is expected to be necessary along local areas within this layer to achieve desired grade, including any infrastructure within the higher velocity range (i.e., generally greater than 7,000± fps), including any locally encountered fresher corestones.

The ray sampling coverage of the subsurface seismic waves that were acquired during the processing of the refraction tomographic models using **Rayfract™**, appeared to be of good quality, which was verified by having a Root Mean Square Error (RMS) of 1.7 to 4.3 percent (see lower right-hand corner of the models). The RMS error (misfit between picked and modeled first break times) is automatically calculated during the processing routine, with a value of less than 5.0% being preferred, which was obtained on all of the seismic models.

Based on the tomographic modeling and typical excavation characteristics observed within granitic bedrock materials, anticipation of gradual increasing hardness with depth should be anticipated during grading. Some lateral velocity variations should be expected to be encountered across the subject property generally due to the presence of buried corestones, dikes, and/or lithologic variabilities.

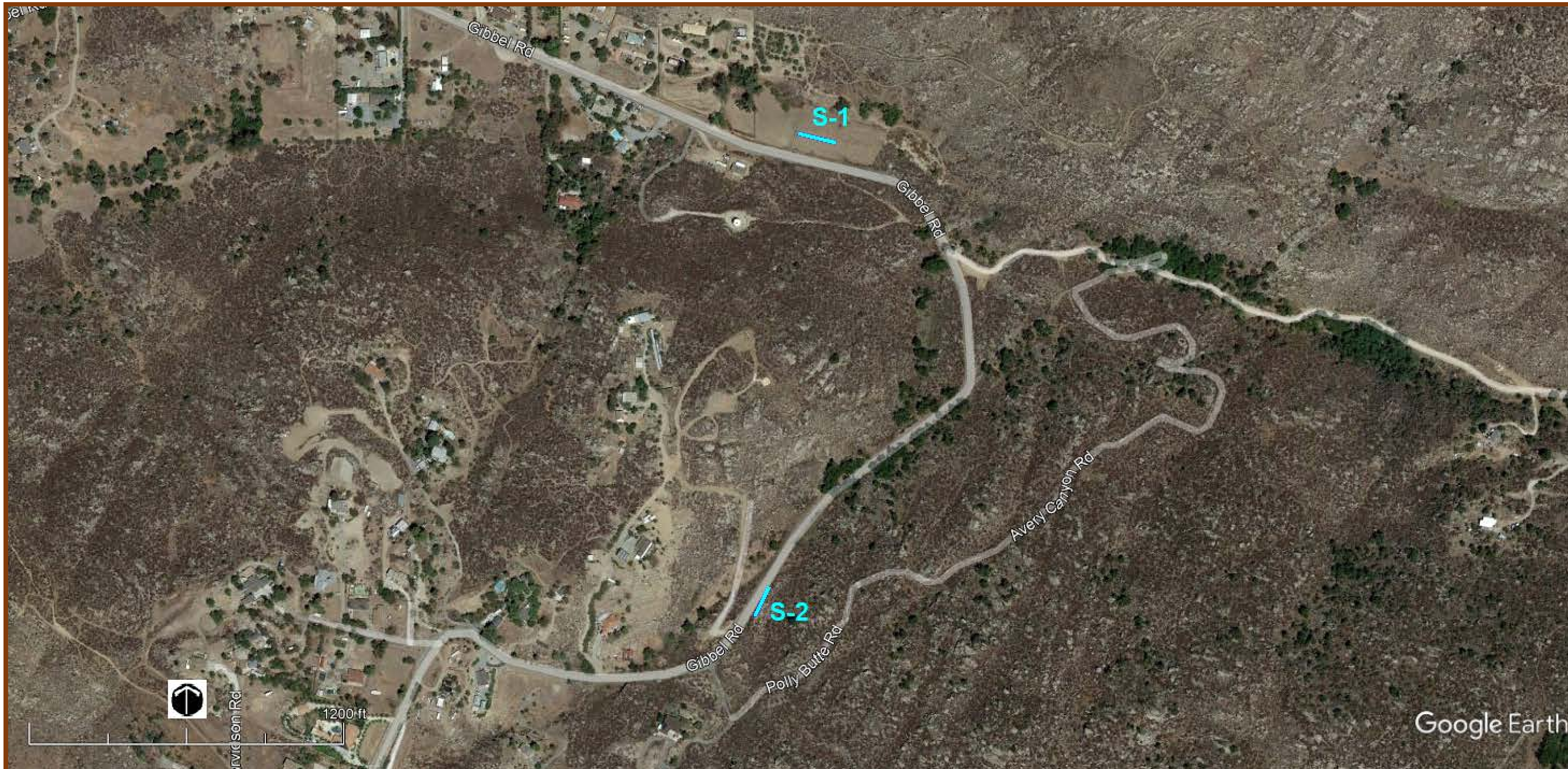
CLOSURE

The field geophysical survey was performed on July 6, 2023, by the undersigned using "state of the art" geophysical equipment and techniques along the selected seismic traverse locations. The seismic data was further evaluated using computerized tomographic inversion techniques to provide a thorough analysis and understanding of the subsurface velocity and structural conditions. It should be noted that our data presented within this report was obtained along two specific locations therefore other areas may contain different velocity layers and depths not encountered during our field survey. Estimates of layer velocity boundaries as presented in this report are generally considered to be within 10± percent of the total depth of the contact.

It is important to understand that the fundamental limitation for seismic refraction surveys is known as nonuniqueness, wherein a specific seismic refraction data set does not provide sufficient information to determine a single “true” earth model. Therefore, the interpretation of any seismic data set uses “best-fit” approximations along with the geologic models that appear to be most reasonable for the local area being surveyed. Client should also understand that when using the theoretical geophysical principles and techniques discussed in this report, sources of error are possible in both the data obtained, and in the interpretation, and that the results of this survey may not represent actual subsurface conditions. These are all factors beyond **Terra Geosciences** control and no guarantees as to the results of this survey can be made. We make no warranty, either expressed or implied.

In summary, the results of this seismic refraction survey are to be considered as an aid to assessing the rippability and excavation potentials of the bedrock locally. This information should be carefully reviewed by the grading contractor and representative “test” excavations with the proposed type of excavation equipment for the proposed construction should be considered, so that they may be correlated with the data presented within this report.

SEISMIC LINE LOCATION MAP



Base Map: Google™ Earth imagery (2023); Seismic traverses S-1 and S-2 shown as blue lines.

PROJECT NO. 233961-1

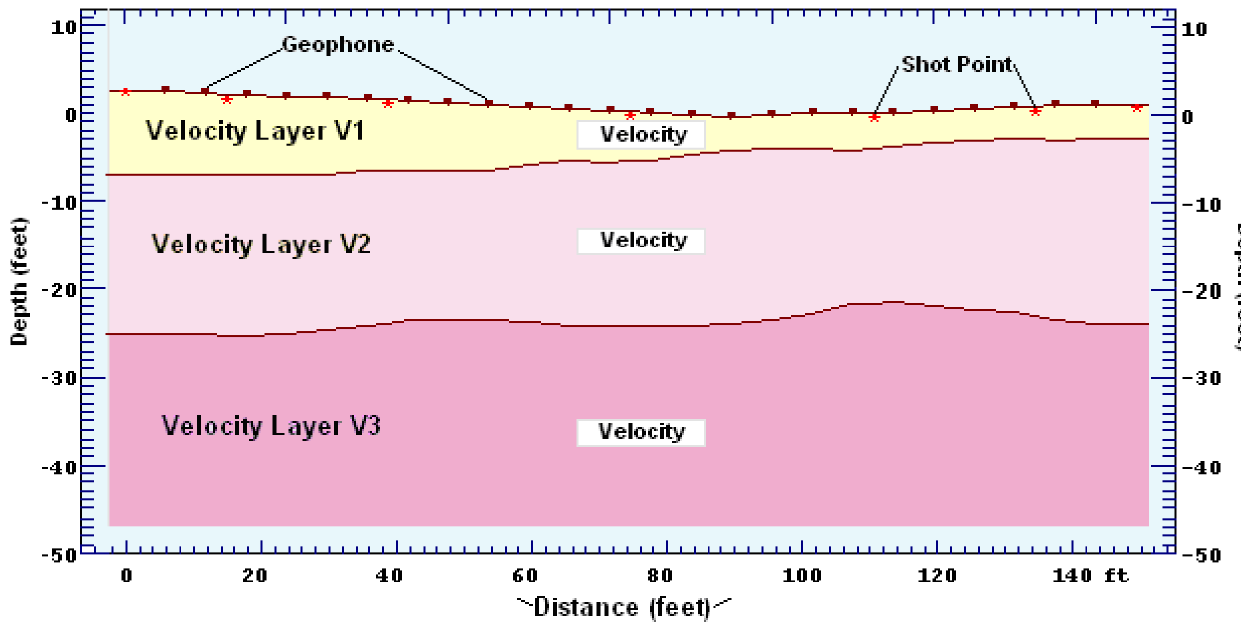
PLATE 1

APPENDIX A

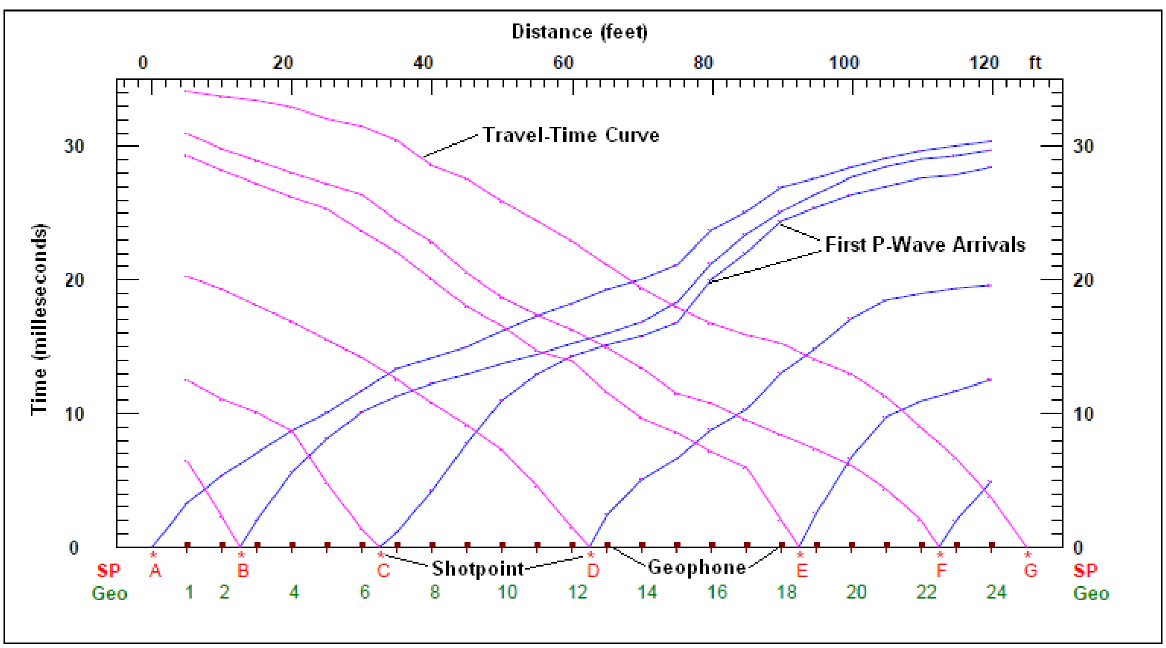
LAYER VELOCITY MODELS

LAYER VELOCITY MODEL LEGEND

LAYER VELOCITY MODEL



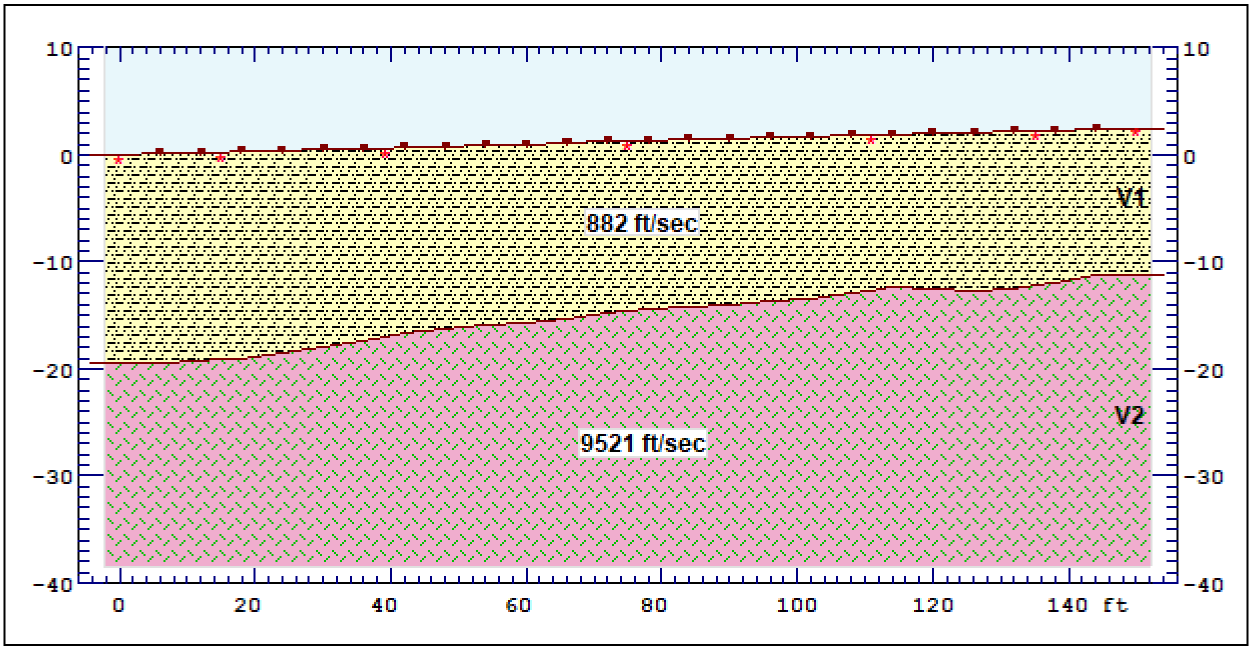
TIME-DISTANCE PLOT



SEISMIC LINE S-1

South 73° East >

LAYER VELOCITY MODEL



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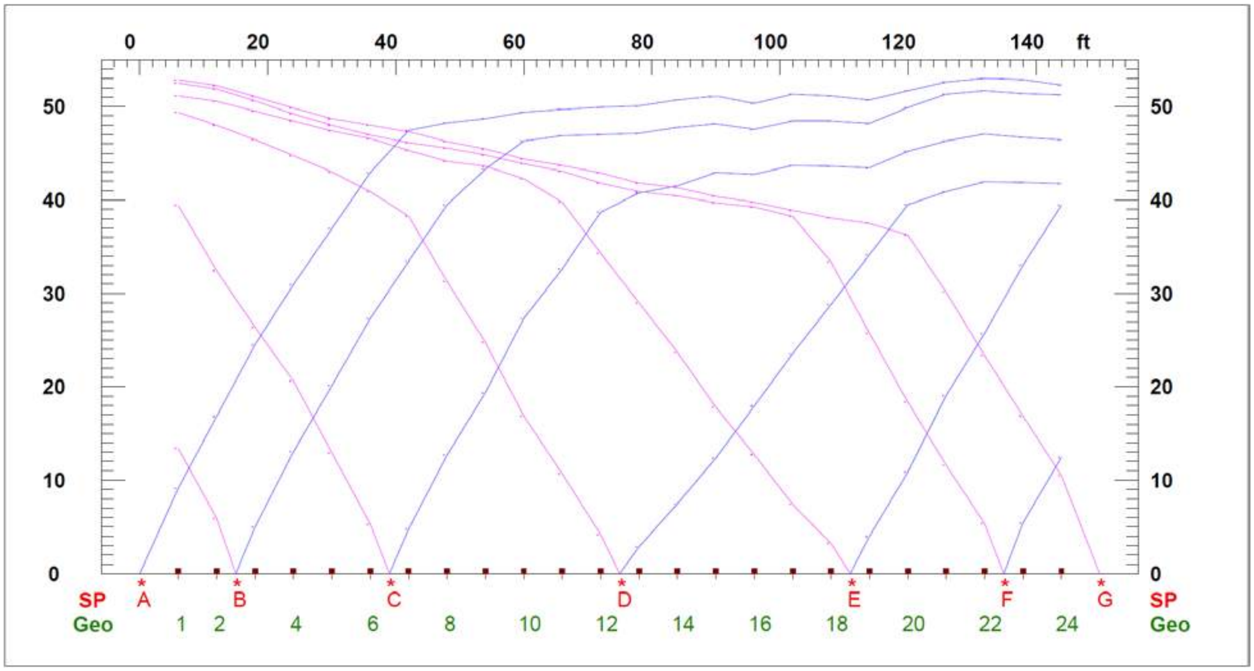
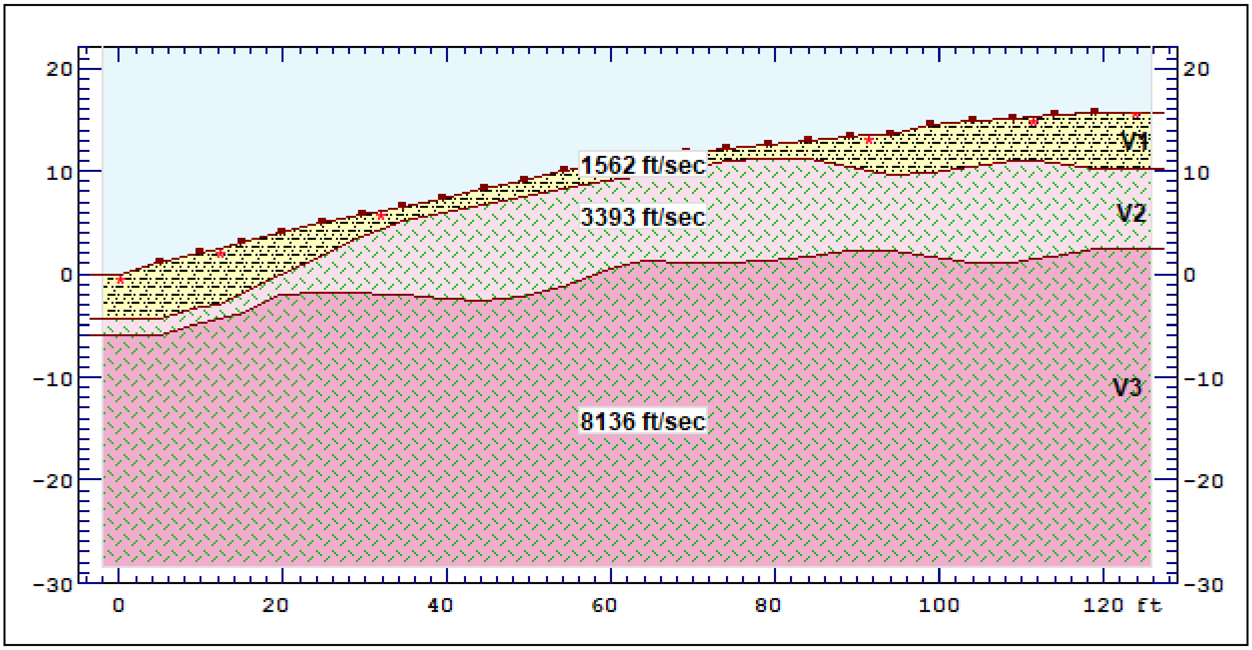


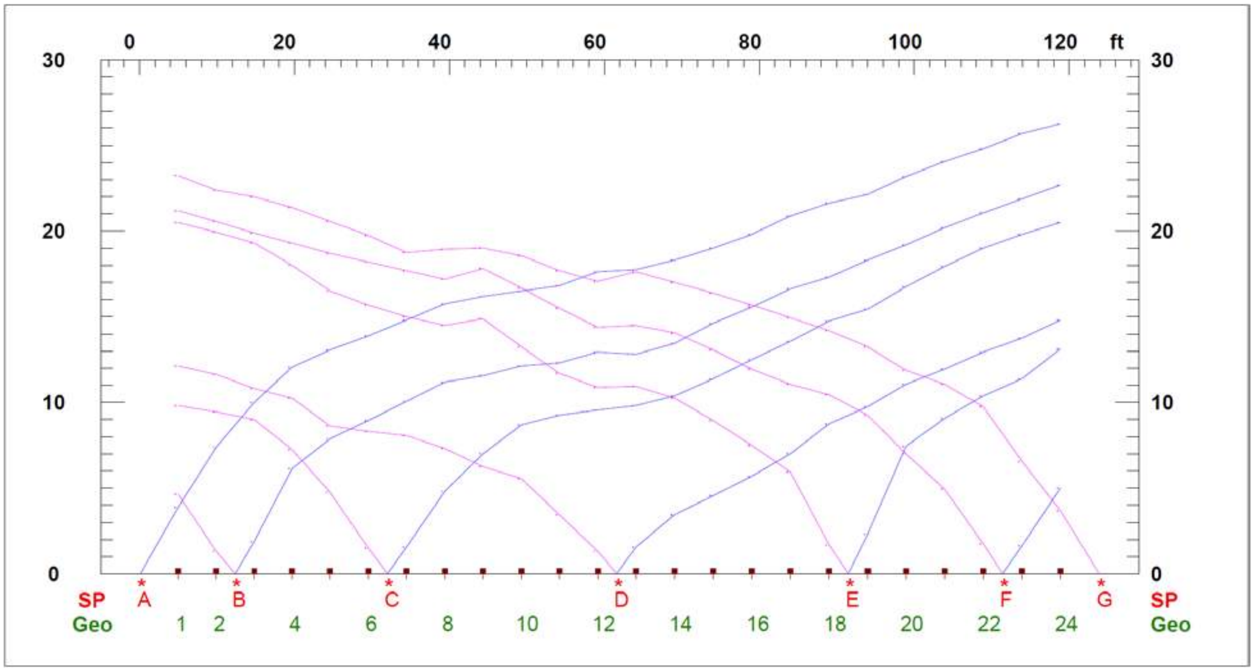
SEISMIC LINE S-2

South 26° West >

LAYER VELOCITY MODEL



TIME-DISTANCE PLOT



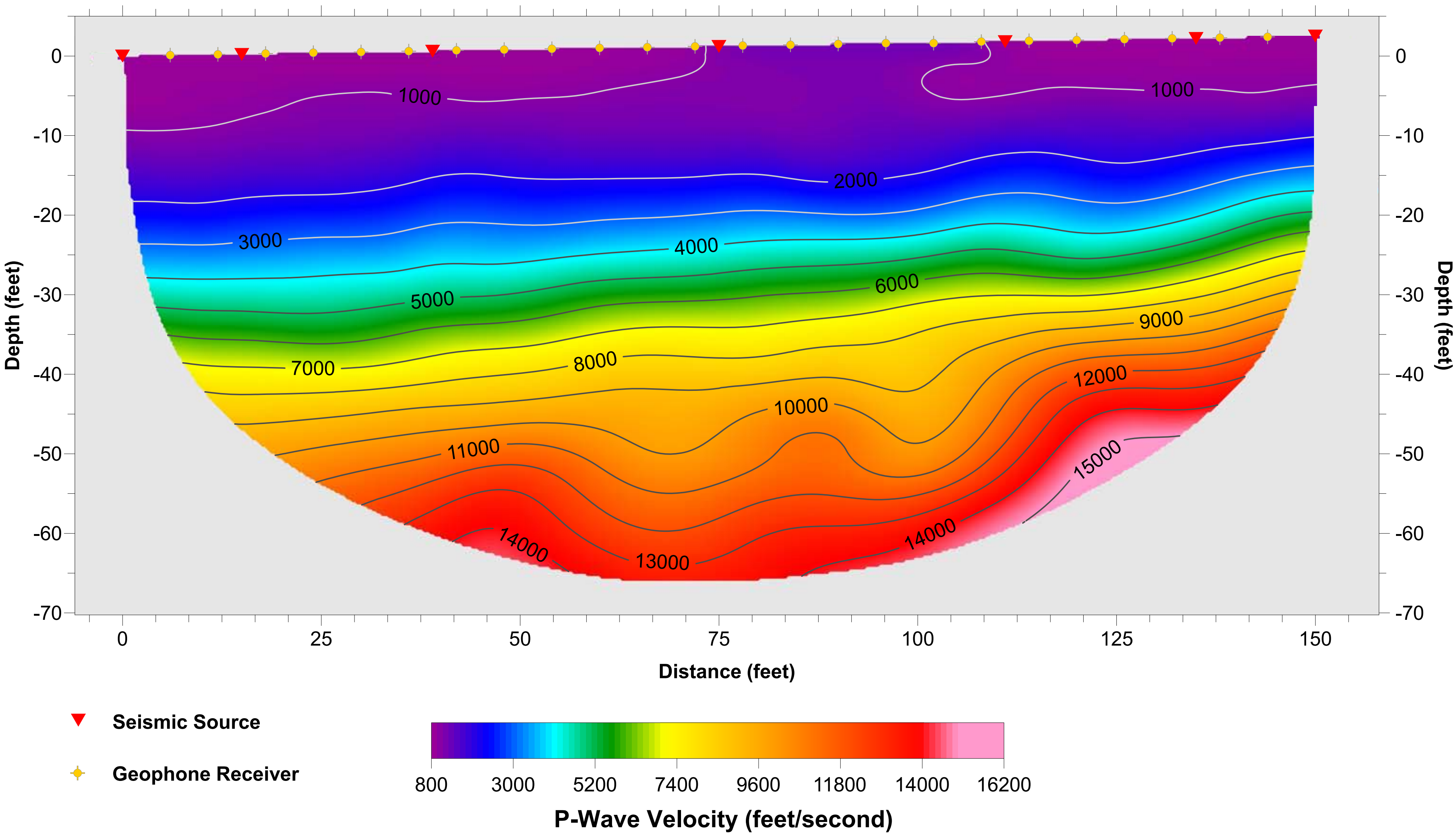
APPENDIX B

REFRACTION TOMOGRAPHIC MODELS

SEISMIC LINE S-1

South 73° East →

REFRACTION TOMOGRAPHIC MODEL

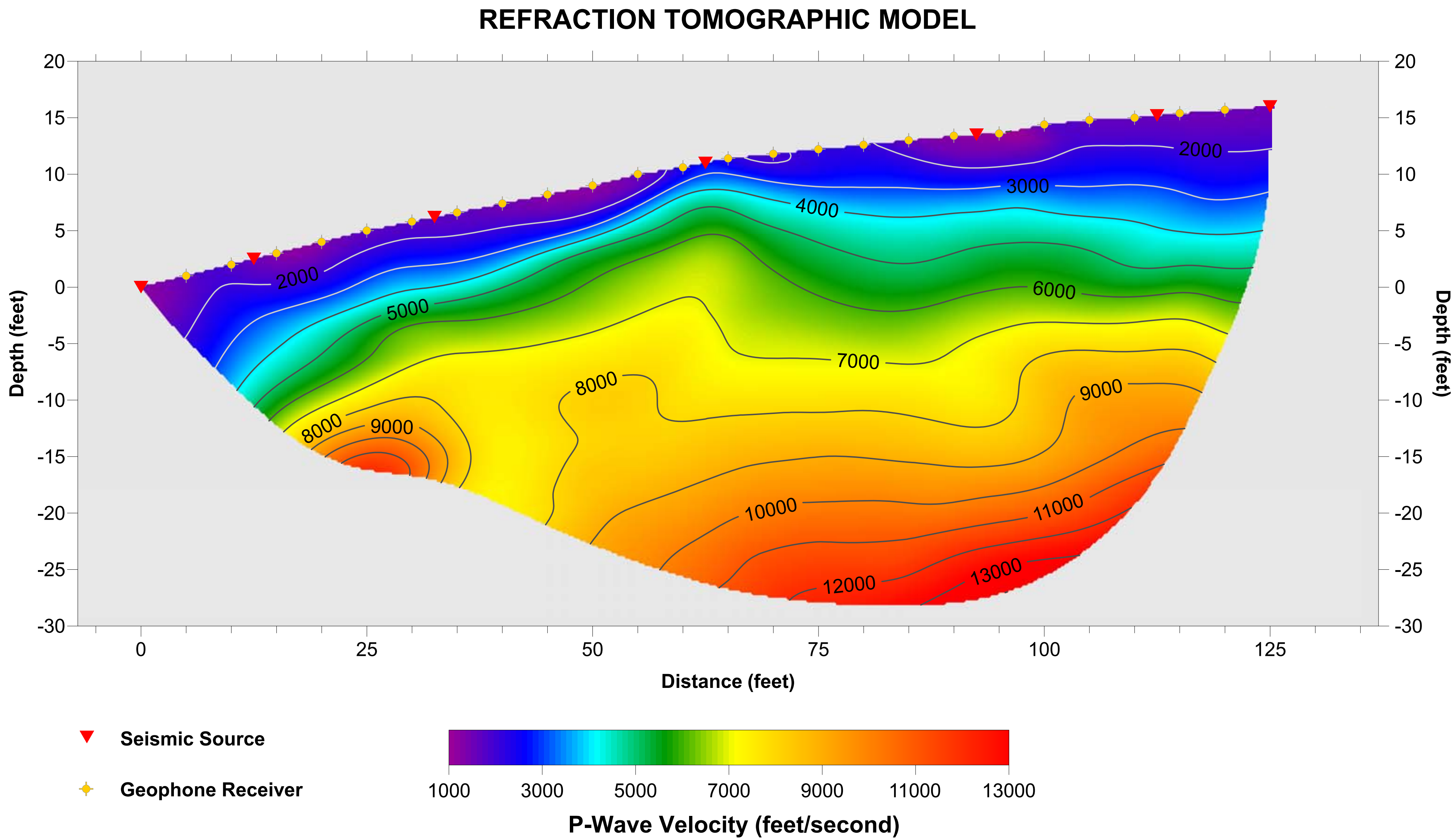


SCALE: 1:1 (Horizontal = Vertical)

RMS error 1.7%, Rayfract Version 4.03

SEISMIC LINE S-2

South 26° West→



SCALE: Vertical Exaggeration 1.25X

RMS error 4.3%, Rayfract Version 4.03

APPENDIX C

EXCAVATION CONSIDERATIONS

EXCAVATION CONSIDERATIONS

These excavation considerations have been included to provide the client with a brief overall summary of the general complexity of hard bedrock excavation. It is considered the client's responsibility to ensure that the grading contractor they select is both properly licensed and qualified, with experience in hard-bedrock ripping processes. To evaluate whether a particular bedrock material can be ripped, this geophysical survey should be used in conjunction with the geologic or geotechnical report prepared for the project which describes the physical properties of the bedrock. The physical characteristics of bedrock materials that favor ripping generally include the presence of fractures, faults and other structural discontinuities, weathering effects, brittleness or crystalline structure, stratification of lamination, large grain size, moisture permeated clay, and low compressive strength. Unfavorable conditions can include such characteristics as massive and homogeneous formations, non-crystalline structure, absence of planes of weakness, fine-grained materials, and formations of clay origin where moisture makes the material plastic.

When assessing the potential rippability of the underlying bedrock of a given site, the above geologic characteristics along with the estimated seismic velocities can then be used to evaluate what type of equipment may be appropriate for the proposed grading. When selecting the proper ripping equipment there are three primary factors to consider, which are:

- ***Down Pressure available at the tip, which determines the ripper penetration that can be attained and maintained,***

- ***Tractor flywheel horsepower, which determines whether the tractor can advance the tip, and,***

- ***Tractor gross-weight, which determines whether the tractor will have sufficient traction to use the horsepower.***

In addition to selecting the appropriate tractor, selection of the proper ripper design is also important. There are basically three designs, being radial, parallelogram, and adjustable parallelogram, of which the contractor should be aware of when selecting the appropriate design to be used for the project. The penetration depth will depend upon the down-pressure and penetration angle, as well as the length of the shank tips (short, intermediate, and long).

Also, important in the excavation process is the ripping technique used as well as the skill of the individual tractor operator. These techniques include the use of one or more ripping teeth, up- and down-hill ripping, and the direction of ripping with respect to the geologic structure of the bedrock locally. The use of two tractors (one to push the first tractor-ripper) can extend the range of materials that can be ripped. The second tractor can also be used to supply additional down-pressure on the ripper. Consideration of light blasting can also facilitate the ripper penetration and reduce the cost of moving highly consolidated rock formations.

All of the combined factors above should be considered by both the client and the grading contractor, to ensure that the proper selection of equipment and ripping techniques are used for the proposed grading.

APPENDIX D

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REFERENCES

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APPENDIX F

PALEONTOLOGICAL RESOURCES ASSESSMENT REPORT

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Mission Canyon II Pump Station Replacement Project

Paleontological Resources Assessment

prepared for

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January 2024

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers
rinconconsultants.com

Table of Contents

Figures

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Executive Summary

Purpose and Scope

Rincon Consultants, Inc. (Rincon) was retained to conduct a Paleontological Resources Assessment (PRA) for Eastern Municipal Water District's (EMWD) Mission Canyon II Pump Station Replacement Project (project) in Riverside County, California. This PRA includes a literature review, museum records search, paleontological sensitivity assessment, and reporting consistent with the professional standards of the Society of Vertebrate Paleontology (SVP 2010), to determine whether the proposed action would result in significant impacts to paleontological resources under the California Environmental Quality Act (CEQA).

Results of Investigation

The study area is located within unincorporated Riverside County, California primarily along Gibbel Road within the City of Hemet sphere of influence. The study area is underlain by three geologic units, Quaternary old axial channel deposits, Quaternary old alluvial fan deposits, and Hemet Pluton (Morton & Matti 2005). Sediments similar to Quaternary old axial channel deposits and Quaternary old alluvial fan deposits have produced scientifically significant paleontological resources throughout Riverside County (Jefferson 2010; Paleobiology Database 2023; University of California Museum of Paleontology 2023); therefore, the County of Riverside (2015) has assigned these geologic units a "High A" paleontological sensitivity. The Hemet Pluton is formed of intrusive igneous rock, which cannot preserve paleontological resources and, therefore, has low paleontological sensitivity.

A records search of the Western Science Center recovered no known fossil localities within one mile of the study area (McDonald 2023).

Impacts and Recommendations

Ground-disturbing construction activities that affect previously undisturbed portions of geologic units with a "High A" paleontological sensitivity could result in significant impacts to paleontological resources under CEQA.

Ground-disturbing construction activities for this project are anticipated to consist of trenching for new pipeline segments and excavations to remove approximately 10 linear feet of pipeline associated with the existing Mission Canyon II Pump Station. Trenching for Components 3, 4, and 7, do not have the potential to significantly impact paleontological resources because they would only impact low-sensitivity geologic units. Excavation of small pits along Component 6, conversely, would impact sediments with a "High A" paleontological sensitivity and may significantly impact paleontological resources. Components 1, 2, and 5, do not have the potential to significantly impact paleontological resources, because these activities would not impact previously undisturbed sediments.

Mitigation Measure PAL-1 is recommended to reduce potential impacts along Component 6 to paleontological resources to a level of less than significant under CEQA. This mitigation measure involves a paleontological Worker Environmental Awareness Program and provides procedures to be followed in the event of an unanticipated fossil discovery.

1 Introduction

Rincon Consultants, Inc. (Rincon) has conducted a desktop Paleontological Resources Assessment (PRA) for the Eastern Municipal Water District's (EMWD) Mission Canyon II Pump Station Replacement Project (project) in Riverside County, California. This assessment includes a literature review, paleontological records search, paleontological sensitivity assessment, and reporting consistent with the professional standards of the Society of Vertebrate Paleontology (SVP 2010).

Paleontological resources (i.e., fossils) are the remains or traces of prehistoric life. Fossils are typically preserved in layered sedimentary rocks, and the distribution of fossils across the landscape is controlled by the distribution and exposure of the fossiliferous sedimentary rock units at and near the surface. Construction-related impacts that typically affect or have the potential to affect paleontological resources include mass excavation operations, drilling/borehole excavations, trenching/tunneling, and grading. Ground-disturbing construction activities associated with the proposed project would mainly consist of grading, trenching, and excavation. This PRA provides a list of the formations mapped at the surface within the study area and formations that underlie those mapped at the surface that may be impacted by project construction activities.

1.1 Project Location

The study area is located within unincorporated Riverside County, California (Figure 1) primarily along Gibbel Road, east of State Street (Figure 2), and within the City of Hemet sphere of influence. The study area is in the *Hemet, California* United States Geological Survey 7.5-minute topographic quadrangle. The study area includes parts of Gibbel Road and Polly Butte Road and surrounding areas. The study area includes the project site plus a 100-foot buffer.

Figure 1 Regional Location

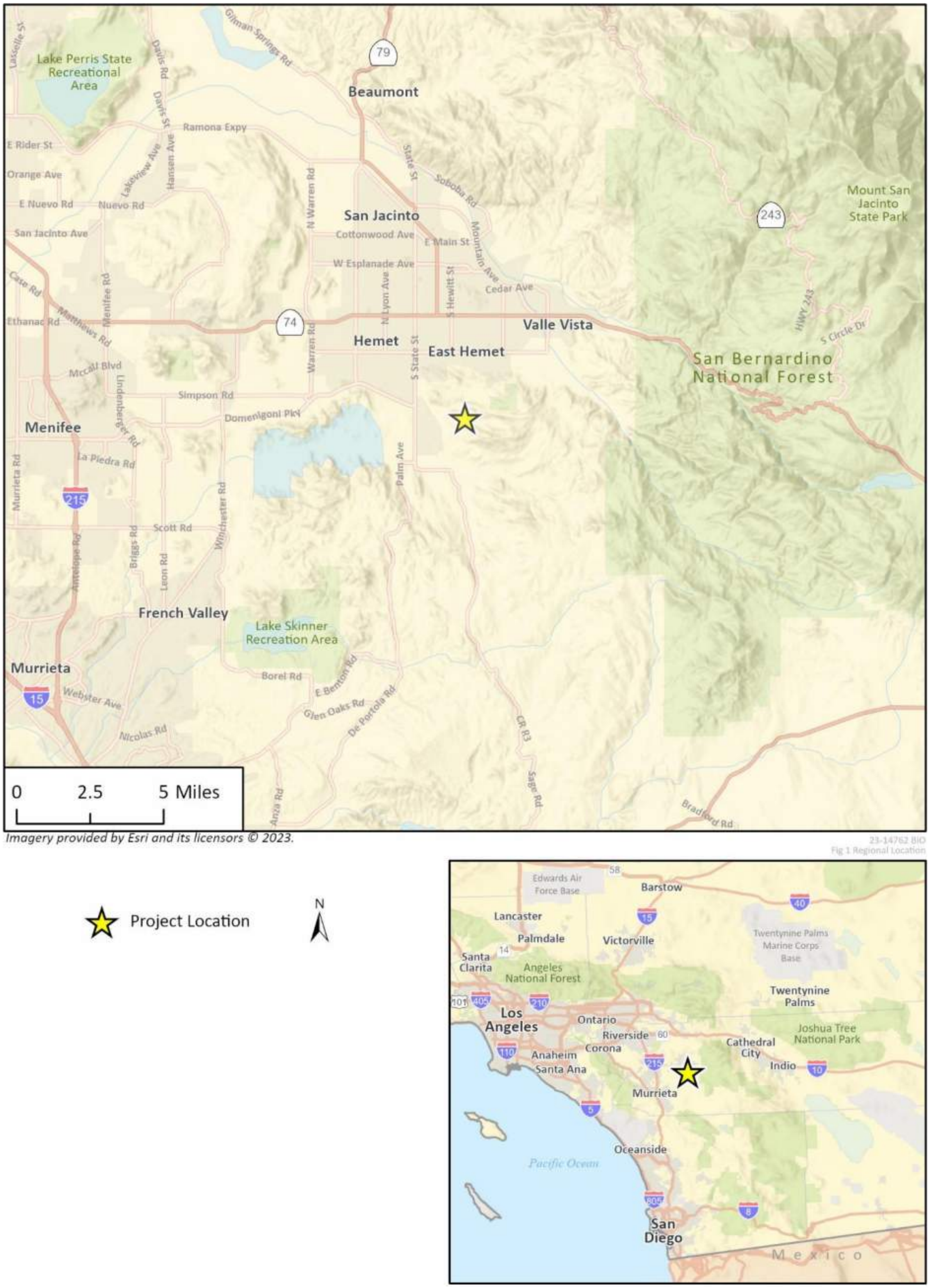
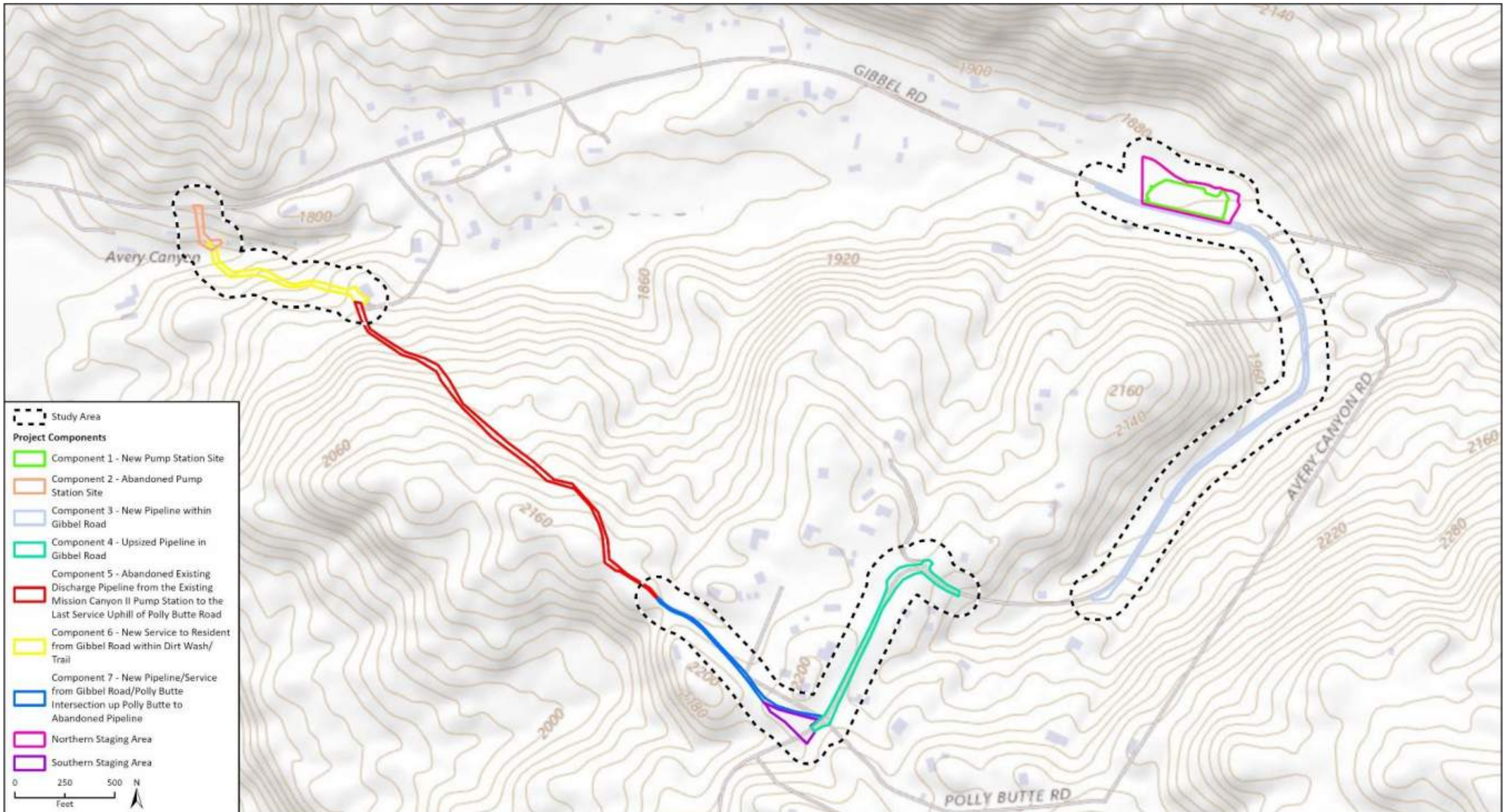


Figure 2 Project Components



Imagery provided by ESRI, USGS, and their licensors © 2024.

1.2 Project Description

The project involves the construction and operation of a new pump station and associated pipelines to address hydraulic capacity issues of the existing Mission Canyon II Pump Station, along with demolition of the existing Mission Canyon II Pump Station. Specifically, EMWD proposes the following seven project components and the use of one staging area (Figure 2):

- **Component 1:** Construct a new Mission Canyon II Pump Station facility along Gibbel Road;
- **Component 2:** Demolish the existing Mission Canyon II Pump Station located off Gibbel Road west of Crow Road;
- **Component 3:** Install approximately 3,200 linear feet (LF) of new 12-inch pipeline in Gibbel Road south of the new pump station;
- **Component 4:** Replace the existing 4-inch pipeline along Gibbel Road to the intersection of Polly Butte Road with approximately 1,100 LF of 8-inch pipeline;
- **Component 5:** Abandon approximately 3,050 LF of an existing 6-inch discharge pipeline from the existing Mission Canyon II Pump Station to the last service uphill of Polly Butte Road;
- **Component 6:** Install 1,050 LF of 2-inch service line from the existing 6-inch pipeline along Gibbel Road to 40751 Gibbel Road; and
- **Component 7:** Replace the existing 6-inch pipeline along Polly Butte Road to the abandoned pipeline with approximately 1,100 LF of 8-inch pipeline.

In total, the volume of material to be excavated from construction of the pipeline is estimated to be approximately 4,300 cubic yards. Excavated material would be reused on site as trench backfill to the extent possible; however, this would not be determined until excavation starts. After construction is complete, all pipeline construction areas would be restored to pre-construction conditions (i.e., no permanent disturbance footprint).

Construction of Proposed Mission Canyon II Pump Station

The proposed Mission Canyon II Pump Station would be constructed on the north side of Gibbel Road (Figure 2). Site development would include:

- pump station building (25-feet by 15-feet) and associated pipeline and appurtenances;
- electrical generator building (12-feet by 5-feet);
- surge tank;
- transformer;
- perimeter block wall (8-feet, concrete masonry unit);
- hinged communication tower;
- security lighting;
- motor-operated wrought iron gate;
- drainage improvements, including a rip rap wall on north, west and east perimeter within the property boundaries; and
- concrete paved driveways off Gibbel Road.

Approximately 8,000 cubic yards (cy) of imported soil would be used to elevate the construction pad for the pump station facilities.

Installation of New and Replacement Pipeline

The project proposes construction and operation of approximately 6,450 linear feet of new and replacement polyvinyl chloride (PVC) pipe from the replacement pump station connection. The proposed segments include (Figure 2):

- approximately 3,200 LF of new 12-inch pipeline along Gibbel Road south of the new pump station;
- approximately 1,100 LF of new 8-inch pipeline along Gibbel Road to the intersection with Polly Butte Road to replace the existing 4-inch pipeline;
- approximately 1,050 LF of new 2-inch service line from Gibbel Road to 40751 Gibbel Road to replace the existing 6-inch pipeline; this pipeline is expected to be slipped-line into the existing pipeline, and would require excavation of small individual pits as needed to help move the new pipeline through angled portion of the pipe; and
- approximately 1,100 LF of new 8-inch pipeline along Polly Butte Road to the abandoned pipeline to replace the existing 6-inch pipeline.

The proposed pipeline would be installed within the rights-of-way of Gibbel Road and a small portion of Polly Butte Road using open-cut trench construction. The trench width would average 3 feet (maximum width would not exceed 4 feet), and trench depth would average 6 feet (maximum depth would not exceed 7 feet).

Replacement 2-inch pipeline between Gibbel Road and 40751 (Component 6) would be slip-lined through the existing 6-inch pipeline, with minimal excavation required along the alignment. Small excavation pits may be necessary along this component.

Demolition of Existing Mission Canyon II Pump Station

The existing Mission Canyon II Pump Station is located between 40591 and 40679 Gibbel Road, approximately 175 feet south of Gibbel Road) would be demolished as part of the project (Figure 2). Above ground infrastructure and appurtenances would be removed and underground pipe up to approximately 10 feet from the pump station would be excavated and removed. The remaining belowground 6-inch pipe would be abandoned in place and used as a slip-line for a new service pipeline to 40751 Gibbel Road.

Abandonment of Existing 6-inch Discharge Line

The existing 6-inch cement mortar lined and coated discharge line from the existing Mission Canyon II Pump Station to the last service on the uphill side of Polly Butte Road would be abandoned in place (Figure 2). The pipeline would be capped at the water service meter at 40751 Gibbel Road and water service meter east of 29250 Polly Butte Road. No pipe would be removed, and no excavation would be required.

2 Regulations

2.1 State

California Environmental Quality Act

Paleontological resources are protected under CEQA, which states a project would “normally” have a significant effect on the environment if project effects exceed an identified threshold of significance (*CEQA Guidelines* Section 15064.7[a]). Appendix G of the *CEQA Guidelines* (the Environmental Checklist Form) provides suggested thresholds of significance for evaluating a project’s environmental impacts, including impacts to paleontological resources. In Section VII(f), the question is posed thus: “Will the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?” To determine the uniqueness of a given paleontological resource, it must first be identified or recovered (i.e., salvaged). Therefore, CEQA mandates mitigation of adverse impacts, to the extent practicable, to paleontological resources.

CEQA does not define “a unique paleontological resource or site.” However, the SVP (2010) has defined a “significant paleontological resource” in the context of environmental review as follows:

> Fossils and fossiliferous deposits, here defined as consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information.

Paleontological resources are typically older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years) (SVP 2010).

The loss of paleontological resources meeting the criteria outlined above (i.e., a significant paleontological resource) would be a significant impact under CEQA, and the CEQA lead agency is responsible for mitigating impacts to paleontological resources, where practicable, in compliance with CEQA and other applicable statutes.

California Public Resources Code

California Public Resources Code Section 5097.5 states:

> No person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

Here “public lands” means those owned by, or under the jurisdiction of, the State or any city, county, district, authority, or public corporation, or any agency thereof. Consequently, public agencies are required to comply with Public Resources Code Section 5097.5 for their own activities, including construction and maintenance, and for permit actions (e.g., encroachment permits) undertaken by others.

2.2 Regional and Local

Riverside County General Plan

Paleontological resources are addressed under the Multipurpose Open Space Element of the Riverside County General Plan (County of Riverside 2015), policies OS 19.6 through OS 19.9, which state the following:

> **OS 19.6**. Whenever existing information indicates that a site proposed for development has high paleontological sensitivity as shown on Figure OS-8, a paleontological resource impact mitigation program (PRMMP) shall be filed with the County Geologist prior to site grading. The PRMMP shall specify the steps to be taken to mitigate impacts to paleontological resources.
>
> **OS 19.7**. Whenever existing information indicates that a site proposed for development has low paleontological sensitivity as shown on Figure OS-8, no direct mitigation is required unless a fossil is encountered during site development. Should a fossil be encountered, the County Geologist shall be notified, and a paleontologist shall be retained by the Project proponent. The paleontologist shall document the extent and potential significance of the paleontological resources on the site and establish appropriate mitigation measures for further site development.
>
> **OS 19.8**. Whenever existing information indicates that a site proposed for development has undetermined paleontological sensitivity as shown on Figure OS-8, a report shall be filed with the County Geologist documenting the extent and potential significance of the paleontological resources on-site and identifying mitigation measures for the fossil and for impacts to significant paleontological resources prior to approval of that department.
>
> **OS 19.9**. Whenever paleontological resources are found, the County Geologist shall direct them to a facility within Riverside County for their curation, including the Western Science Center in the city of Hemet. (This requirement was originally referred to as the SABER Policy – Safeguard Artifacts Being Excavated in Riverside County).

3 Paleontological Resources Assessment Guidelines

Paleontological resources are limited, nonrenewable resources of scientific, cultural, and educational value and are afforded protection under state and local laws and regulations. This PRA satisfies Public Resources Code Section 5097.5 requirements and follows guidelines and significance criteria specified by the SVP (2010) and County of Riverside General Plan (County of Riverside 2015).

3.1 Paleontological Sensitivity

Paleontological sensitivity refers to the potential for a geologic unit to produce scientifically significant fossils. Direct impacts to paleontological resources occur when earthwork activities, such as grading or trenching, cut into the geologic deposits within which fossils are buried and physically destroy the fossils. Because fossils are the remains of prehistoric animal and plant life, they are considered to be nonrenewable. These activities may constitute significant impacts under CEQA or adverse effects under federal environmental protection laws and may require mitigation. Sensitivity is determined by rock type, history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit. Paleontological sensitivity is derived from the known fossil data collected from the entire geologic unit, not just from a specific survey.

The discovery of a vertebrate fossil locality is of greater significance than that of an invertebrate fossil locality, especially if it contains a microvertebrate assemblage. The recognition of new vertebrate fossil locations could provide important information on the geographical range of the taxa, their radiometric age, evolutionary characteristics, depositional environment, and other important scientific research questions. Vertebrate fossils are almost always significant because they occur more rarely than invertebrates or plants. Thus, geologic units having the potential to contain vertebrate fossils are considered the most sensitive.

3.2 Resource Assessment Criteria

Riverside County has been inventoried for geologic formations known to potentially contain paleontological resources. Lands with high, low, or undetermined potential for finding paleontological resources are mapped (County of Riverside 2015: Figure OS-8). These guidelines define the various levels of paleontological resource potential (i.e., “sensitivity”) and provide detailed protocols for the mitigation of adverse impacts to fossil resources during project development.

- **High Potential.** Sedimentary rock units with high potential for containing significant nonrenewable paleontological resources include rock units in which vertebrate or significant invertebrate fossils have been found or determined likely to be present. These units include, but are not limited to, sedimentary formations that contain significant non-renewable paleontological resources anywhere within their geographical extent and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. High sensitivity includes not only the potential for yielding abundant vertebrate fossils, but also for production of a few significant fossils that may provide new and significant data. High sensitivity areas are mapped as either “High A” or “High B,” according to the following criteria:

  - **High Sensitivity A.** Based on geologic formations or mapped rock units that are known to contain or have the correct age and depositional conditions to contain significant paleontological resources. These include rocks of Silurian or Devonian age and younger that have potential to contain remains of fossil fish, and Mesozoic and Cenozoic rocks that contain fossilized body elements and trace fossils such as tracks, nests and eggs.
  - **High Sensitivity B.** Equivalent to High A but is based on the occurrence of fossils at a specified depth below the surface. This category indicates fossils that are likely to be encountered at or below 4 feet of depth and may be impacted during construction activities. The qualified paleontologist approved by the County ("Project Paleontologist") will create and implement a project-specific PRMMP to be approved by the County Geologist prior to the issuance of a grading permit. Construction monitoring and details covering the treatment of fossil discoveries are included in the PRMMP. Any significant specimens discovered will need to be prepared, identified, and curated into a museum. A final report documenting the significance of the finds will also be required.
- **Low Potential.** Lands for which previous field surveys and documentation show a low potential for containing significant paleontological resources subject to adverse impacts. The mapping of low potential was determined based on actual documentation and was not generalized to cover all areas of a particular rock unit on a geologic map. Mitigation is not typically required unless a fossil is encountered during site development. If a fossil is encountered, the County Geologist shall be notified, and a paleontologist shall be retained by the Project proponent. In such cases, the paleontologist shall document the extent and potential significance of the paleontological resources on the site and establish appropriate mitigation measures for further site development.
- **Undetermined Potential.** Areas underlain by sedimentary rocks for which literature or unpublished studies are not available have undetermined potential for containing significant paleontological resources. A field survey is required prior to the commencement of construction activities by a qualified vertebrate paleontologist to assess the unit's paleontological potential as either High or Low.

4 Methods

Rincon reviewed published geologic maps to identify the geologic units present at and below the surface within the study area (Morton & Matti 2005). Rincon reviewed the online paleontological collections database of the University of California Museum of Paleontology (2023) and Paleobiology Database (2023) and consulted primary literature to identify known fossil localities in Riverside County and surrounding regions from similar geologic units to those identified within the study area. Rincon requested a records search of the Western Science Center on October 30, 2023, to identify any fossil localities known from within the study area or nearby fossil localities known from the same geologic units as those underlying the study area. The study area contains no bedrock exposures of geologic units with a "High A" paleontological sensitivity; therefore, a field survey was not warranted.

Paleontological sensitivity ratings of the geological formations were assigned based on the findings of the records search and literature review and based on the potential effects to nonrenewable paleontological resources from project construction following SVP (2010) guidelines.

5 Description of Resources

5.1 Geologic Setting

The study area is situated in the Peninsular Ranges (Figure 1), one of the eleven major geomorphic provinces in California (California Geological Survey 2002). In general, the Peninsular Ranges consist of northwest-southeast trending mountain ranges and faults (Norris and Webb 1976). These mountains are generally comprised of Mesozoic to Cenozoic plutonic and extrusive igneous and Cretaceous marine sedimentary rocks. The Peninsular Ranges province also contains sedimentary basins such as the Los Angeles Basin which have accumulated thick sequences of Cenozoic marine and terrestrial sedimentary rocks.

Locally, the study area is located within and just south of Avery Canyon, a canyon within the western Santa Rosa Hills that drains into the Diamond Valley (Figure 2).

5.2 Geology of the Study Area

The geology of the region around the study area was mapped by Morton and Matti (2005) who identified three geologic units within the study area: Quaternary old axial channel deposits, Quaternary old alluvial fan deposits, and the Hemet Pluton (Figure 3).

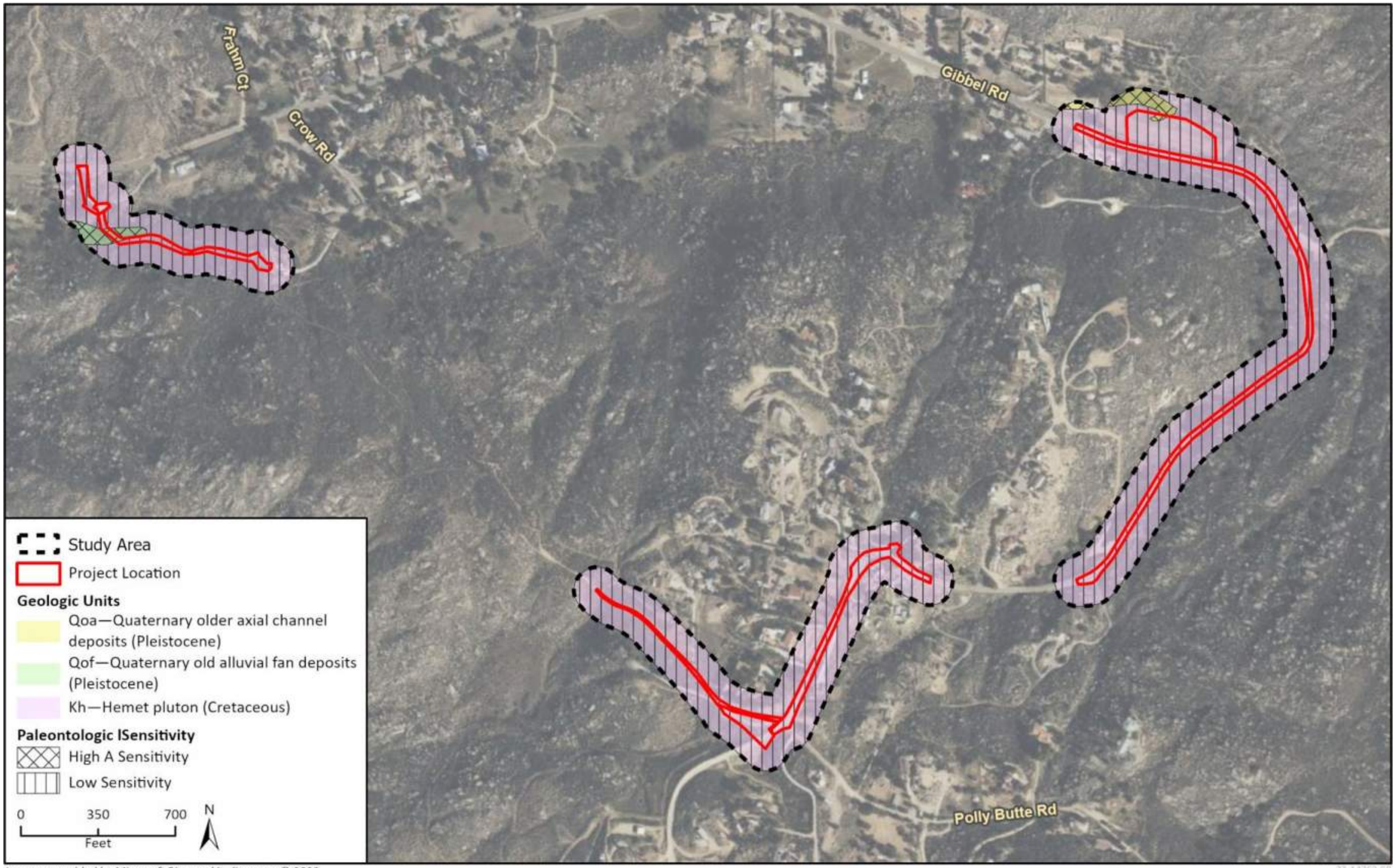
Quaternary Old Axial Channel Deposits

Quaternary old axial channel deposits underlie a small part of Component 1 (Figure 3). Quaternary old axial channel deposits consist of moderately consolidated gravel, sand, silt, and clay, that are late to middle Pleistocene in age (Morton & Matti 2005). Pleistocene-aged alluvial sediments, similar to Quaternary old axial channel deposits have produced many scientifically significant paleontological resources in Riverside County, yielding taxa such as mastodon (*Mammut*), American lion (*Panthera atrox*), saber-toothed cat (*Smilodon*), camel (*Hemiauchenia*, *Camelops*), other mammals, reptiles, birds, and amphibians (Jefferson 2010; Paleobiology Database 2023; University of California Museum of Paleontology 2023). Quaternary old axial channel deposits have a “High A” paleontological sensitivity (County of Riverside 2015).

Quaternary Old Alluvial Fan

Quaternary old alluvial fan deposits underlie a small part of Component 6 (Figure 3). Quaternary old alluvial fan deposits consist of moderately consolidated, reddish-brown gravel and sand that are late to middle Pleistocene in age (Morton & Matti 2005). Pleistocene-aged alluvial sediments, similar to Quaternary old alluvial fan deposits have produced many scientifically significant paleontological resources in Riverside County, yielding taxa such as mastodon (*Mammut*), American lion (*Panthera atrox*), saber-toothed cat (*Smilodon*), camel (*Hemiauchenia*, *Camelops*), other mammals, reptiles, birds, and amphibians (Jefferson 2010; Paleobiology Database 2023; University of California Museum of Paleontology 2023). Quaternary old alluvial fan deposits have a “High A” paleontological sensitivity (County of Riverside 2015).

Figure 3 Geologic Map and Paleontological Sensitivity of the Study Area



Imagery provided by Microsoft Bing and its licensors © 2023.
Geology information provided by "Hemet", Morton & Matti, 2005.

Hemet Pluton

The Hemet Pluton underlies the majority of the study area, including most of Components 1 and 6, all of Components 2, 3, 4, and 7, and the construction staging area (Figure 3). The Hemet Pluton consists of various intrusive igneous rocks, primarily hornblende and tonalite, that are Cretaceous in age (Morton & Matti 2005). Intrusive igneous rocks form via the cooling of molten rock below Earth's surface and, thus, cannot preserve paleontological resources. The Hemet Pluton has Low paleontological sensitivity (County of Riverside 2015).

5.3 Paleontology of the Study Area

Rincon requested a fossil locality search from the Western Science Center on October 30, 2023, which recovered no known fossil localities within a one-mile radius of the study area (McDonald 2023). However, there are localities bearing scientifically significant paleontological resources known from Pleistocene-aged sediments in Diamond Valley to the west of the study area.

6 Evaluation, Impacts, and Recommendations

6.1 Paleontological Sensitivity Evaluation

The study area is directly underlain by two geologic units, Quaternary old alluvial fan deposits and Hemet Pluton, though a third, Quaternary old axial channel deposits, is mapped near the study area (Figure 3). As indicated in Section 5, *Description of Resources*, Quaternary old axial channel deposits and Quaternary old alluvial fan deposits have a "High A" paleontological sensitivity, and the Hemet Pluton has low paleontological sensitivity.

6.2 Impacts

Significant impacts to paleontological resources include the destruction, damage, or loss of scientifically important paleontological resources or associated stratigraphic data. Ground-disturbing activities (i.e., grading, excavating, trenching) in undisturbed sediments or geologic units with high paleontological sensitivity (i.e., Quaternary old alluvial fan deposits) have the potential to significantly impact paleontological resources under CEQA.

Ground-disturbing construction activities for this project are anticipated to consist of trenching for new pipeline segments and excavations to remove approximately 10-feet of pipeline associated with the existing Mission Canyon II Pump Station.

Open cut trenching and/or excavation for the installation of several new segments of pipeline (i.e., Components 3, 4, and 7) will reach an average of 6 feet (maximum depth would not exceed --7 feet) below the surface. The majority of trenching and/or excavation will occur in areas mapped as the Hemet Pluton, which has low paleontological sensitivity, but (of the excavation of small pits associated with the slip-lining of Component 6 pipeline may occur within sediments mapped as having a "High A" paleontological sensitivity, Quaternary old alluvial fan deposits (Figure 3). Therefore, minor excavations that may be required for Component 6 dohave the potential to significantly impact paleontological resources.

Excavations to remove pipeline associated with the existing pump station (i.e., Component 2) would only impact previously disturbed sediments and, thus, are not expected to significantly impact paleontological resources.

Components 1 and 5 will not significantly impact paleontological resources. Component 1 (i.e., construction of the new Mission Canyon II Pump Station) will involve raising the existing grade to form a building pad for the new facility, so no previously undisturbed sediments will be impacted. Component 5 involves the abandonment of existing pipeline and will not involve any ground disturbance.

6.3 Recommendations

The following mitigation measure would address potentially significant impacts under CEQA if paleontological resources are encountered during project-related ground-disturbing activities. This measure would only apply to ground-disturbing activities in previously undisturbed sediments associated with the potential minor excavation of small pits occurring at Component 6. Implementation of Mitigation Measure PAL-1 would effectively mitigate the project's potentially significant impacts under CEQA, through the recovery, identification, and curation of previously unrecovered fossils.

PAL-1 Unanticipated Fossil Discovery

Paleontological Worker Environmental Awareness Program. Prior to the start of construction at Component 6, a Qualified Professional Paleontologist, as defined by the Society of Vertebrate Paleontology (SVP 2010), or their designee shall conduct a paleontological Worker Environmental Awareness Program (WEAP) training for construction personnel regarding the appearance of fossils and the procedures for notifying paleontological staff should fossils be discovered by construction personnel.

Unanticipated Discovery of Paleontological Resources. EMWD shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. If a potential fossil is discovered during project construction, construction activity within 50 feet of the find shall cease until the discovery is examined by a Qualified Professional Paleontologist. If the find is determined to be significant, the Qualified Professional Paleontologist shall direct all mitigation measures related to paleontological resources consistent with the SVP (2010) standards.

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8 List of Preparers

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- Shannon Carmack, Principal

APPENDIX G

HYDROLOGY STUDY

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UNT Mission Canyon Flood Study – Riverside County, CA

PREPARED FOR:	Eastern Municipal Water District (EMWD) Gustavo A. Gomez, PE
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PROJECT NUMBER:	2023-1081-00 100453.15
DATE:	08 January 2023

Background

The site of a proposed water pump station in Unincorporated Riverside County, CA, Community Number 060245, designed by Ardurra for the Eastern Municipal Water District (EMWD), is adjacent to an unnamed arroyo, which has no effective FEMA flood insurance study (FIS) and no established base flood elevation (BFE). The approximate address of the site of the proposed water pump station is 41458 Gibbel Road, Hemet, CA 92544 and it located in parcel 450210022 (assessor's parcel number, APN). The footprint of the site is approximately 1.5 acres inside the 71-acre parcel and is bounded on the west by residential properties and to the north, south, and east by arid mountainous terrain. The floodplain of the unnamed arroyo near the site would be mapped in FEMA FIRM Panel 06065C2110G. The purpose of this study is to determine the impact of the proposed water pump station site on the floodplain by analysis of the existing and proposed hydraulic and hydrologic conditions. The establishment of a BFE for the unnamed arroyo is *not* the purpose of this study.

The study will include the delineation of the floodplain of the unnamed arroyo near the site of the proposed water pump station. The calculations were done using a HEC RAS 6.3.1 model developed for the study for one-dimensional steady flow analysis. The floodplain is defined by the peak flow rate during the 100-year, 24-hour storm at studied cross sections and is delineated from elevation maps. The peak flow rate during the 100-year storm was calculated using a HEC-HMS 4.11 model developed for this study with inputs from Riverside County Flood Control and Water Conservation District's HEC-HMS preprocessor. The floodplain is interpolated between cross sections to smoothly transition between calculated widths.

There are four hydraulic models presented in this study: two sets of current conditions and proposed conditions models. The 100-year water surface elevations (WSEL) of the initial current and proposed conditions models were defaulting to critical depth. To achieve valid subcritical results, the overbank roughness coefficients (n-values) were all set to a value of 0.1. Therefore, Model Set 1 contains current and proposed conditions models with overbank n-values that reflect real conditions and Model Set 2 contains current and proposed conditions models with overbank n-values set to 0.1. Channel n-values are the same for both model sets. Model Set 2 will be the primary model set used for analysis.

Definitions

ANNUAL EXCEEDANCE PROBABILITY (AEP) means the probability, expressed as a percentage, of an event being equaled or exceeded within a 365-day time span. Event occurrences are independent of each other. Refer to Return Period.

BFE means Base Flood Elevation. This is the WSEL during the 100-year event.

FEMA means Federal Emergency Management Agency.

FIRM means Flood Insurance Rate Map.

FIS means Flood Insurance Study.

FLOODPLAIN means the area subject to flooding during the prescribed flooding event.

FLOODWAY means the area within the floodplain reserved for conveyance of floodwaters during the 100-year event. It is typically defined by encroaching equally on both sides of the floodplain until a prescribed increase in the WSEL is achieved. Refer to Figure 1- Floodway Schematic below.

Figure 1 – Floodway Schematic

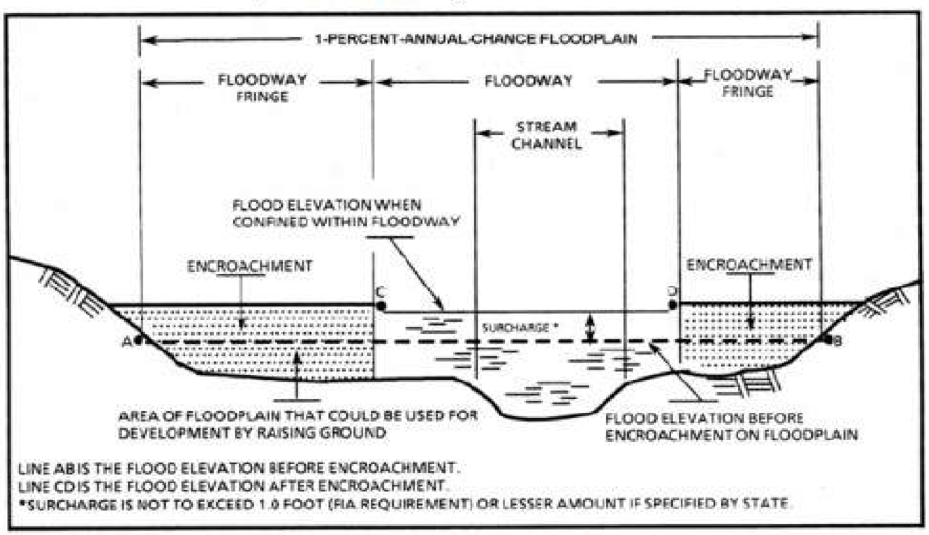


Figure 1 – Floodway Schematic

LOWEST FINISHED FLOOR (LFF) means the lowest elevation in a building including basements.

RETURN PERIOD means the probability, expressed as a year, of an event being equaled or exceeded within a given time span. For example, a 25-year storm event has a 4% probability of occurring within a 365-day period, while a 100-year storm event has a 1% probability of occurring within a 365-day period. Event occurrences are independent of each other. Refer to Annual Exceedance Probability.

WATER SURFACE ELEVATION (WSEL) means the highest elevation water achieves during a prescribed storm event.

Area Studied

This is a new study of an unnamed arroyo in Riverside County, CA to determine the boundary of the floodplain and to determine what effect, if any, the proposed water pump station site has on the floodplain. This analysis includes two (2) driveway culvert crossings downstream of the proposed water pump station site. These culverts are each 3.3 feet by 4.3 feet elliptical corrugated metal pipe culverts. The unnamed arroyo is unstudied by FEMA, and therefore the inputs to this study's calculations are not sourced from any FEMA materials. The region surrounding the proposed water pump station site is arid and mountainous with scattered boulders, grass, brush, and trees.

Engineering Methods

Hydrological Analysis:

The outflow point of the drainage basin used for the hydrological analysis, which is the most downstream point of the hydraulic analysis, is approximately 650 feet downstream of the proposed water pump station site. The 1400-acre drainage basin was delineated using USGS topographic quadrangle maps. The distribution of hydrologic soil groups in the drainage basin was determined using the USDA National Resource Conservation Center's Web Soil Survey tool. The hydrologic soil group data was compared to land coverage, which included 1-acre residential lots and natural ground surface, determined by land and aerial photography. In order to analyze the hydrology using HEC-HMS, Riverside County requires the use of their HEC-HMS Preprocessor. The soil groups and land coverage were used for the loss rate values in the Preprocessor. Precipitation depths for the 1-, 3-, 6-, and 24-hour 100-year storms were found on NOAA's Precipitation Frequency Data Server (PFDS), which were used in the HEC-HMS Preprocessor in inches. Areal Adjustment factors were found in the Riverside County Hydrology Manual, Plate E-5.8. The slope of the intensity duration curve for the 1-hour 100-year storm was found in the Riverside County Hydrology Manual, Plate D-4.6.

For the Lag Time Calculator (LTC) in the HEC-HMS Preprocessor, the drainage basin was divided into natural areas and residential areas with one acre lots, which Plate D-5.6 in the Riverside County Hydrology Manual says have 0% and 20% impervious area, respectively. The non impervious areas consist primarily of sand, light brush, and boulders and a Basin Factor (n-value) of 0.065 is used in the LTC based on this visual estimation. The length along longest watercourse (L) used in the LTC is the measured distance from the outfall to the hydraulically most distant point in the drainage basin. The Length along longest watercourse measured upstream to a point opposite the centroid of the area (Lca) used in the LTC is the measured distance from the outfall to opposite side of the drainage basin (via the centroid) measured along the watercourse.

Riverside County's HEC-HMS Preprocessor uses runoff index values to determine the runoff loss rate in the drainage basin. Hydrologic soil group types were determined using the USDA-NRCS Web Soil Survey. Land cover was visually determined to be Open Brush in Fair condition, for the pervious portion of the drainage basin. Land use was measured to be 90% natural/agricultural and 10% 1-acre residential lots in the 1400-acre drainage basin. Combinations of soil group/land cover and land use were used to determine the runoff index values and the loss rate values.

The HEC-HMS Preprocessor produced tables of effective rainfall for the drainage basin based on the inputs described above. Effective rainfall is the amount of precipitation per unit of time throughout a given storm minus the precipitation that will be lost to infiltration. The unit time interval selected for the effective rainfall table is 5-minutes. The effective rainfall table includes data for the 1-, 3-, 6-, and 24-hour 100-year storms.

In HEC-HMS, the drainage basin is modeled as a single subbasin with a meteorological model, precipitation gage, and control specification. The subbasin is modeled with no losses, as the effective rainfall already accounts for losses, and uses the SCS Unit Hydrograph method. The 100-year 24-hour effective rainfall table was used to create a hyetograph in the precipitation gage. The peak discharge during the 100-year 24-hour storm was calculated to be 622 cfs. Hydrology information, inputs, and results can be found in Appendix A.

<u>Hydraulic Analysis:</u>

The HEC-RAS (v.6.3.1) computer program was used to calculate the limits of the floodplain under a one-dimensional, steady flow analysis. The program performs a step backwater calculation by balancing the energy equation between two consecutive stream cross sections. Losses are calculated using Manning's Equation and by applying expansion and contraction coefficients. The Momentum Equation is used at stream crossings and where the WSEL is rapidly changing.

Survey data of the site and supplementary LiDAR elevation data were used to create the cross sections. Cross sections were entered into the Geometry Data File of the model using the accepted convention of left to right looking downstream. Distances to the next downstream cross section were measured along the stream for the channel and the overland flow path for the right and left overbank. Channel bank stations were selected based on channel geometry at transitions in cross-sectional slope. Where there is no clearly defined channel or the channel is too wide, a small pilot channel has been added by editing the cross-section along the centerline of the arroyo to convey daily flows.

Manning's n-values were assigned based on aerial photos from Google Earth and additional photos taken by surveyors from Cozad and Fox. For Model Set 1, over bank n-values range from 0.021 to 0.1. For Model Set 2, over bank n-values are set to 0.1 and the channel n-value range from 0.03 to 0.1. The over bank n-values are set to 0.1 where the cross-section intersects the proposed site to provide a conservative estimate of the site's effect on the WSEL. Channel n-value range from 0.03 to 0.04 for both model sets. Descriptions of overbank and channel n-values for Model Set 1 can be found in Appendix B. Expansion and contraction coefficients were set to 0.1 and 0.3 respectively for all typical cross sections and to 0.3 and 0.5 for cross sections up and downstream of road crossings.

Survey information was also provided by Cozad and Fox for three (3) driveway culvert crossings. All driveway culvert crossings are downstream of the proposed water pump station site. Two of the three crossings were modeled. The most-downstream culvert crossing was not modeled because the effect of the two crossings upstream of it make the hydraulic effect of the most-downstream crossing negligible at the site. The Energy Equation was used to calculate the WSEL for discharges passing through the culvert and overtopping the road. For overtopping, the two modeled driveways were modeled as broad crested weirs. The most downstream of the two modeled culvert crossings, at river station 0.040, is modeled as being half-full of debris, based on photos taken by Cozad and Fox. These photographs can be found in Appendix B The most-upstream culvert crossing, at river station 0.095, is modeled being clear of debris.

The peak discharge rate of the 100-year storm event was entered into the Steady Flow Data file of the model. A discharge rate of 622 cfs is used for the 100-year return period, as calculated by the HEC-HMS model. Downstream boundary conditions were set to normal depth conditions with a slope of 0.005 ft/ft slope.

Analysis of the unnamed arroyo assumed a Steady State, One Dimensional, Sub Critical Flow condition.

Results

Based on this study, the 1% Annual Exceedance Probability (AEP), or 100-year, WSEL for the studied portion of the unnamed arroyo ranges from 1931.98 ft, NAVD 88 at the upstream limits of the property to 1861.41 ft, NAVD 88 at the downstream limits in Model Set 1. In Model Set 2, the 100-year WSEL ranges from 1932.07 ft, NAVD 88 at the upstream limits of the property to 1862.29ft, NAVD 88 at the downstream limits.

A summary of the HEC-RAS model results is presented in Tables 1 and 2 below.

Table 1 - Summary of Model Set 1 Flood Data

River Station (mi)	AEP	Flow (CFS)	Current Conditions WSEL (FT, NAVD 99)	Current Conditions Critical WSEL (FT, NAVD 99)	Proposed Conditions WSEL (FT, NAVD 99)	Proposed Conditions Critical WSEL (FT, NAVD 99)	Rise in WSEL (FT)
0.394	1%	622	1931.98	1931.98	1931.98	1931.98	0.00
0.319	1%	622	1902.16	1902.16	1902.16	1902.16	0.00
0.267	1%	622	1887.66	1887.66	1887.66	1887.66	0.00
0.199	1%	622	1879.13		1879.15	1879.04	0.02
0.186	1%	622	1877.82	1877.82	1877.82	1877.82	0.00
0.170	1%	622	1876.38	1876.28	1876.39	1876.26	0.01
0.159	1%	622	1875.41	1875.41	1875.37	1875.37	-0.04
0.147	1%	622	1874.10	1874.10	1874.10	1874.10	0.00
0.098	1%	622	1868.00	1868.00	1868.00	1868.00	0.00
0.095	1%	Culvert					
0.092	1%	622	1865.59	1865.59	1865.59	1865.59	0.00
0.042	1%	622	1863.00	1862.98	1863.00	1862.98	0.00
0.040	1%	Culvert					
0.038	1%	622	1862.44	1862.44	1862.44	1862.44	0.00
0.023	1%	622	1861.41	1860.96	1861.41	1860.96	0.00

Table 2 - Summary of Model Set 2 Flood Data

River Station (mi)	AEP	Flow (CFS)	Current Conditions WSEL (FT, NAVD 99)	Current Conditions Critical WSEL (FT, NAVD 99)	Proposed Conditions WSEL (FT, NAVD 99)	Proposed Conditions Critical WSEL (FT, NAVD 99)	Rise in WSEL (FT)
0.394	1%	622	1932.07	1932.07	1932.07	1932.07	0.00
0.319	1%	622	1902.67	1902.67	1902.67	1902.67	0.00
0.267	1%	622	1888.10	1887.98	1888.22	1887.98	0.12
0.199	1%	622	1879.75	1879.37	1879.78	1879.41	0.03
0.186	1%	622	1878.38	1878.22	1878.38	1878.22	0.00
0.170	1%	622	1877.17	1876.66	1877.19	1876.65	0.02
0.159	1%	622	1875.88	1875.88	1875.85	1875.85	-0.03
0.147	1%	622	1874.70	1874.70	1874.71	1874.71	0.01
0.098	1%	622	1869.24	1869.24	1869.24	1869.24	0.00
0.095	1%	Culvert					
0.092	1%	622	1866.53	1866.53	1866.53	1866.53	0.00
0.042	1%	622	1863.57	1863.57	1863.57	1863.57	0.00
0.040	1%	Culvert					
0.038	1%	622	1862.85	1862.85	1862.85	1862.85	0.00
0.023	1%	622	1862.29	1861.52	1862.29	1861.52	0.00

As shown in Tables 1 and 2, there is only a small difference between the current and proposed conditions models results (maximum rise of 0.12’ in Model Set 2 at station 0.267), suggesting that the proposed development does not have a significant effect on the floodplain. Table 1 includes the results from Model Set 1 and shows that the WSEL is usually defaulting to critical depth. In most cases, the critical depths found in Model Set 1 are the result of HEC-RAS exhausting its set number of available iterations without finding a valid subcritical answer. To achieve more subcritical results, Model Set 2 was created with overbank n-values set to 0.1. This successfully increased the number of valid subcritical results where they would be expected. The WSEL still defaults to critical depth at certain places, particularly far upstream, where the slope is greater, and near the culverts.

Model summary sheets including cross section information, profile output table, and profile elevation plot can be found in Appendices C and D (Model Set 1 and 2, respectively). See the mapped floodplain of the property below and in Appendix E.

Figure 2 shows the current and proposed conditions floodplain boundaries of Model Set 2. The proposed site is within the boundary of the current conditions floodplain, which is what causes the small rise in WSE during the 100-year storm shown in Table 2. The proposed conditions floodplain is narrower than the current conditions floodplain due to the proposed fill in the current conditions floodplain that makes the cross section narrower. Cross-sections can be found in Appendices C and D (Model Set 1 and

2, respectively). The horizontal difference between the current and proposed conditions floodplain boundaries on the north side of the arroyo is less than 0.5’ and cannot be seen in Figure 2. The low point elevation of the pump station pad on the site is approximately 1882.43’ and is shown in cross sections 0.159 and 0.170. The pump station pad is 6.58’ and 5.24’ above the 100-year WSEL in cross-sections 0.159 and 0.170, respectively.

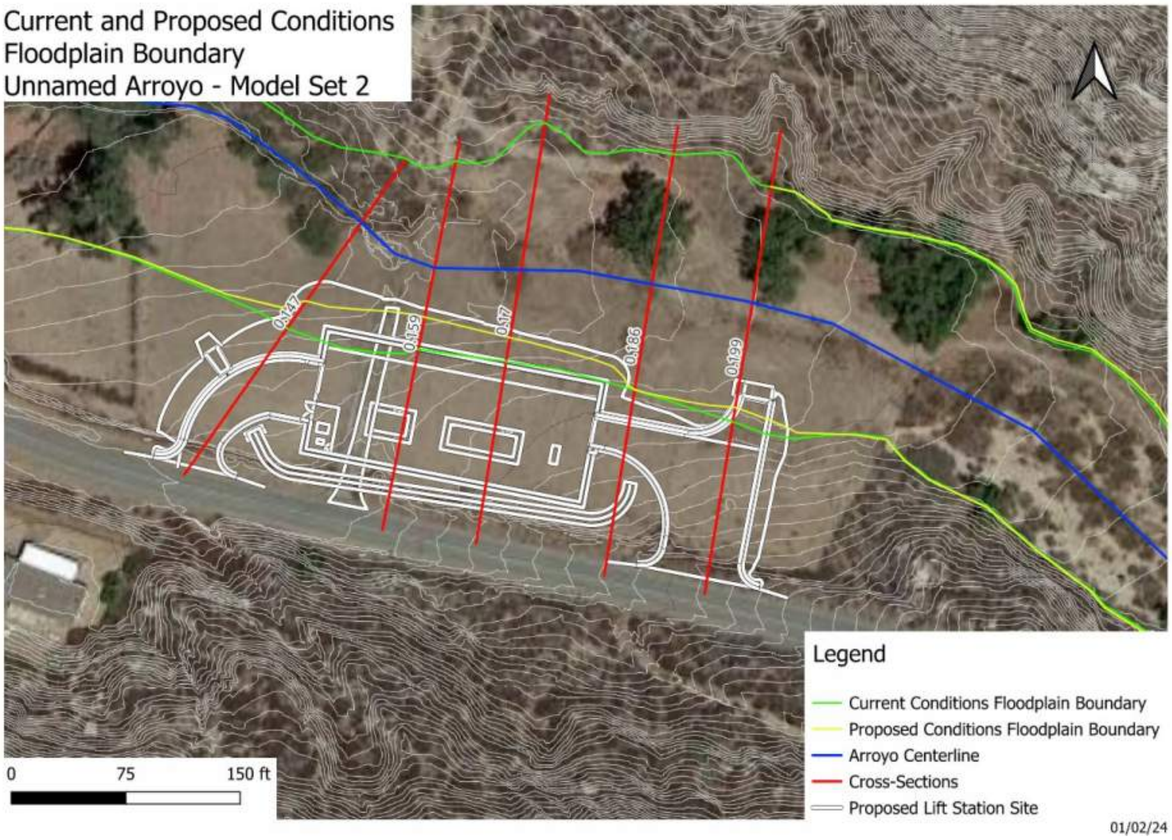


Figure 2 – Model Set 2 Current and Proposed Conditions Floodplain Boundaries

Conclusion and Recommendations

The proposed water pump station will have no adverse impacts to downstream water surface elevations and no adverse impacts to the downstream culverts during a 100-year storm event. The proposed water pump station does alter the floodplain near the site. It is recommended that the LFF of any building on this parcel be set at least one (1) foot above the calculated 100-year WSEL proximate to the structure’s location. This will provide some security against flooding from events greater than the 100-year event. The pump station pad on the site is, on average, 6’ above the 100-year WSEL as currently designed. As the site is partially located inside the floodplain, an elevation certificate from FEMA may be desired to certify the proper elevation above the 100-year flood elevation. An elevation certificate may be required post-construction to fulfill any local requirements. A review of the local floodplain ordinance and regulations should be completed to determine what, if any, requirements this project is subject to. A copy of the elevation certificate form can be found in Appendix F. A scour analysis where the proposed site overlaps with the floodplain should be completed to prevent excessive erosion of the site post-construction.

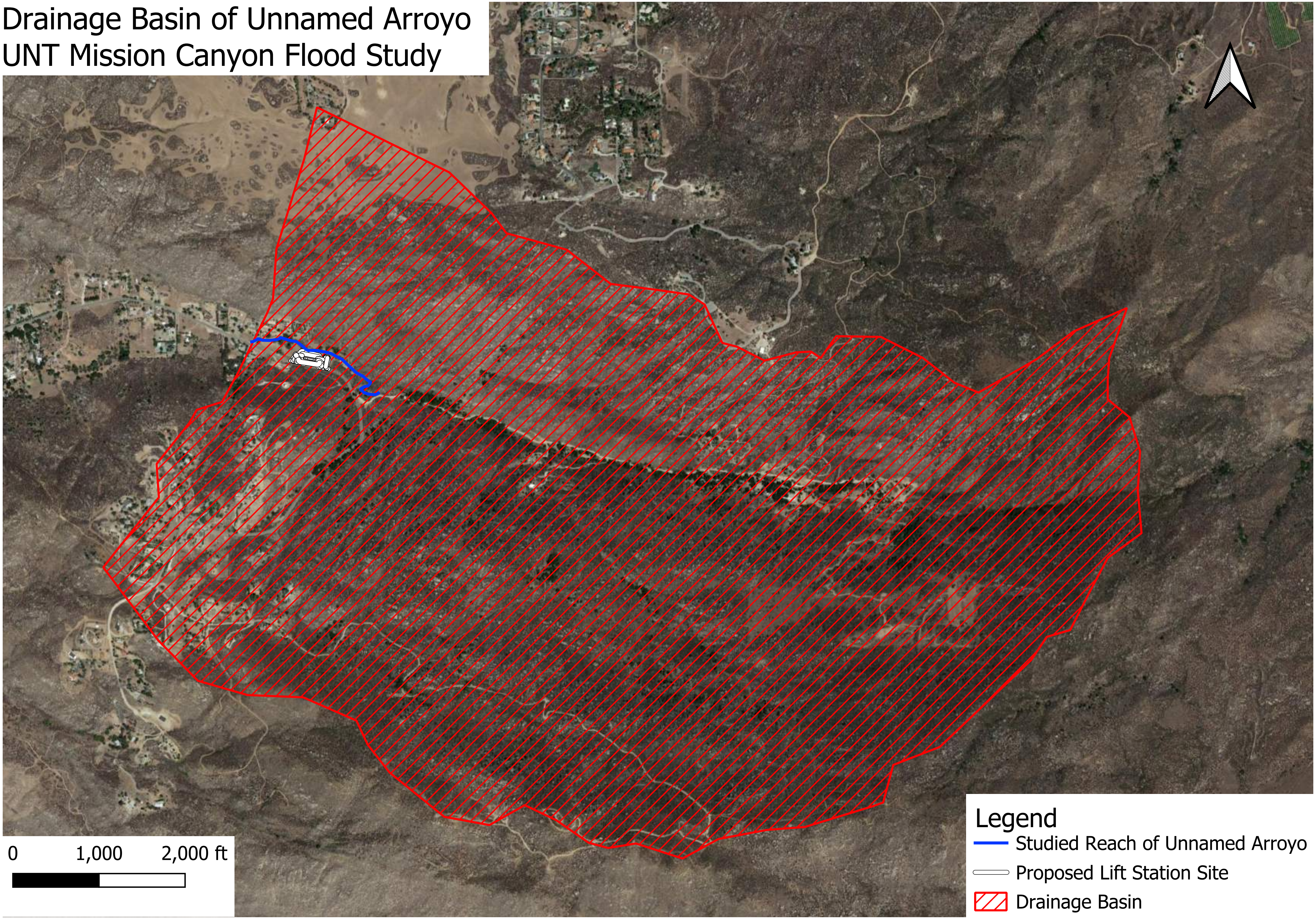
Appendices

A. Hydrology Data
B. Model Input Data
C. Model Set 1 Output Data
D. Model Set 2 Output Data
E. Floodplain Mapping of Unnamed Arroyo at Proposed Site
F. Elevation Certificate Form

Appendix A

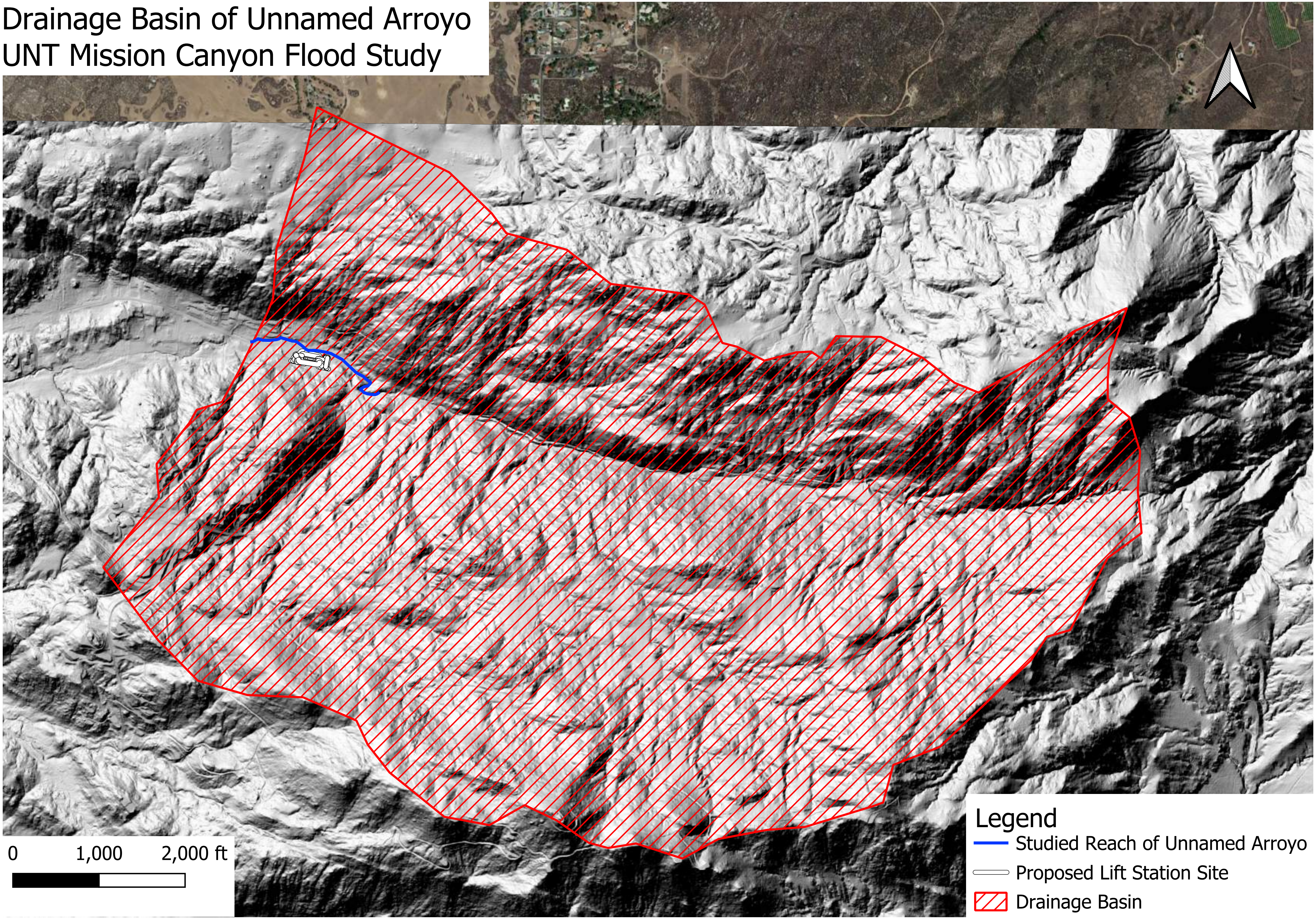
Hydrology Data

Drainage Basin of Unnamed Arroyo
UNT Mission Canyon Flood Study



12/22/23

Drainage Basin of Unnamed Arroyo
UNT Mission Canyon Flood Study



User Manual
Contact Project Planning **(951) 955-1200**

HEC HMS Preprocessor

Watershed Area [ ] sq mi

1 Hour Storm	*3 Hour Storm*	*6 Hour Storm*	*24 Hour Storm*
Point Precipitation 1.60 in.	Point Precipitation 2.22 in.	Point Precipitation 2.94 in.	Point Precipitation 5.50 in.
Areal Adjustment Factor 98 %	Areal Adjustment Factor 99 %	Areal Adjustment Factor 99.25 %	Areal Adjustment Factor 99.5 %
Adjusted Point Precipitation 1.57	Adjusted Point Precipitation 2.2	Adjusted Point Precipitation 2.92	Adjusted Point Precipitation 5.47
Slope of Rainfall Intensity - Duration Curve 0.515			

Lag Time Calculator

Basin Factor - n	0.065	
Length along longest watercourse - L	8804	ft
Length along longest watercourse measured upstream to a point opposite the centroid of the area - Lca	10674	ft
Elevation Difference	810	ft
Lag Time	**0.764**	**hr**
40% Lag Time	18.3	min

Run

Loss Rate Data | Effective Rainfall | S-Graphs

(•) Average Adjusted Loss Rate Calculator (Plate E-2.1) ( ) Average Adjusted Loss Rate (Manual Entry)

Add Loss Rate Values

AMC Condition: II

Soil Group / Cover Type View Chart	RI Number	Perv. Area Infiltrn Rate (in/hr)	Land Use	Imp. Area Decimal %	Adj.Infiltrn Rate (in/hr)	Area (acres)		
-							Add	

Soil Group / Cover Type	RI Number	Perv. Area Infiltrn Rate (in/hr)	Land Use	Imp. Area Decimal %	Adj.Infiltrn Rate (in/hr)	Area (acres)	Area/ Total Area	Ave. Adj. Rate (in/hr)
Open Brush Fair A	46	0.61100	Natural or Agriculture (0)	0	0.611	4.63	0.003	0.002 X
Open Brush Fair B	66	0.40500	Natural or Agriculture (0)	0	0.405	61.52	0.044	0.018 X
Open Brush Fair C	77	0.27900	Natural or Agriculture (0)	0	0.279	14.78	0.011	0.003 X
Open Brush Fair D	83	0.21000	Natural or Agriculture (0)	0	0.21	1188.61	0.846	0.178 X
Open Brush Fair A	46	0.61100	40,000 S.F. 1 Acre Lots (20)	20	0.501	11.14	0.008	0.004 X
Open Brush Fair B	66	0.40500	40,000 S.F. 1 Acre Lots (20)	20	0.332	21.24	0.015	0.005 X
Open Brush Fair D	83	0.21000	40,000 S.F. 1 Acre Lots (20)	20	0.172	102.41	0.073	0.013 X
					Total area =	1404.33		
							Average Soil Loss =	0.223

HEC-HMS PREPROCESSOR - EFFECTIVE RAINFAL OUTPUT TABLE

Loss Rate Data | Effective Rainfall | S-Graphs

Unit Time Period: 5 min (Use interval less than 40% of lag time)

Low Loss: 85 %

Fm (Percentage of F) (24-hour Storm Only): 60 % (Typically 50-75%)

Run

1 Hour

Unit Time	Effective Rainfall (inches)
00:00	
00:05	0.0488
00:10	0.0504
00:15	0.0551
00:20	0.0598
00:25	0.0708
00:30	0.0802
00:35	0.0927
00:40	0.1210
00:45	0.1806
00:50	0.4393
00:55	0.0896
01:00	0.0535

3 Hour

Unit Time	Effective Rainfall (inches)
00:05	0.0100
00:10	0.0100
00:15	0.0056
00:20	0.0144
00:25	0.0144
00:30	0.0210
00:35	0.0144
00:40	0.0210
00:45	0.0210
00:50	0.0144
00:55	0.0166
01:00	0.0210
01:05	0.0298
01:10	0.0298
01:15	0.0298
01:20	0.0254
01:25	0.0386
01:30	0.0408
01:35	0.0342
01:40	0.0408
01:45	0.0539
01:50	0.0495
01:55	0.0452
02:00	0.0474
02:05	0.0495
02:10	0.0737
02:15	0.0913
02:20	0.0583
02:25	0.1309
02:30	0.1419
02:35	0.1616
02:40	0.1111
02:45	0.0254
02:50	0.0210
02:55	0.0210
03:00	0.0020

6 Hour

Unit Time	Effective Rainfall (inches)
00:05	0.0022
00:10	0.0026
00:15	0.0026
00:20	0.0026
00:25	0.0026
00:30	0.0018
00:35	0.0018
00:40	0.0018
00:45	0.0018
00:50	0.0018
00:55	0.0018
01:00	0.0048
01:05	0.0048
01:10	0.0048
01:15	0.0048
01:20	0.0048
01:25	0.0048
01:30	0.0048
01:35	0.0048
01:40	0.0048
01:45	0.0048
01:50	0.0048
01:55	0.0048
02:00	0.0077
02:05	0.0048
02:10	0.0077
02:15	0.0077
02:20	0.0077
02:25	0.0077
02:30	0.0077
02:35	0.0077
02:40	0.0077
02:45	0.0106
02:50	0.0106
02:55	0.0106
03:00	0.0106
03:05	0.0106
03:10	0.0135
03:15	0.0135

24 Hour

Unit Time	Effective Rainfall (inches)
00:05	0.0006
00:10	0.0006
00:15	0.0006
00:20	0.0008
00:25	0.0008
00:30	0.0008
00:35	0.0008
00:40	0.0008
00:45	0.0008
00:50	0.0011
00:55	0.0011
01:00	0.0011
01:05	0.0008
01:10	0.0008
01:15	0.0008
01:20	0.0008
01:25	0.0008
01:30	0.0008
01:35	0.0008
01:40	0.0006
01:45	0.0008
01:50	0.0011
01:55	0.0011
02:00	0.0011
02:05	0.0011
02:10	0.0011
02:15	0.0011
02:20	0.0011
02:25	0.0011
02:30	0.0011
02:35	0.0014
02:40	0.0014
02:45	0.0014
02:50	0.0014
02:55	0.0014
03:00	0.0014
03:05	0.0014
03:10	0.0014
03:15	0.0014

HEC-HMS 100-YR 24-HR STORM INPUTS

Basin Model

Name: Basin 1
Description:
Unit System: U.S. Customary
Sediment: No
Replace Missing: No
Local Flow: No
Unregulated Outputs: No
Flow Ratios: No
Terrain Data: --None--

Subbasin | Transform | Options

Basin Name: Basin 1
Element Name: Subbasin-1
Description:
Downstream: --None--
*Area (MI2) 2.19
Latitude Degrees:
Longitude Degrees:
Discretization Method: --None--
Canopy Method: --None--
Snow Method: --None--
Surface Method: --None--
Loss Method: --None--
Transform Method: SCS Unit Hydrograph
Baseflow Method: --None--

Subbasin | **Transform** | Options

Basin Name: Basin 1
Element Name: Subbasin-1
Graph Type: Standard (PRF 484)
*Lag Time (MIN) 45.84

Meteorology Model | Basins | Options

Met Name: 100-YR 24-HR
Description:
Unit System: U.S. Customary
Shortwave: --None--
Longwave: --None--
Precipitation: Specified Hyetograph
Temperature: --None--
Windspeed: --None--
Pressure: --None--
Dew Point: --None--
Evapotranspiration: --None--
Replace Missing: Set To Default

Control Specifications

Name: 100-YR 24-HR
Description: 100yr- 24-hr simulation
*Start Date (ddMMMYYYY) 01Jan2023
*Start Time (HH:mm) 00:00
*End Date (ddMMMYYYY) 02Jan2023
*End Time (HH:mm) 00:00
Time Interval: 5 Minutes

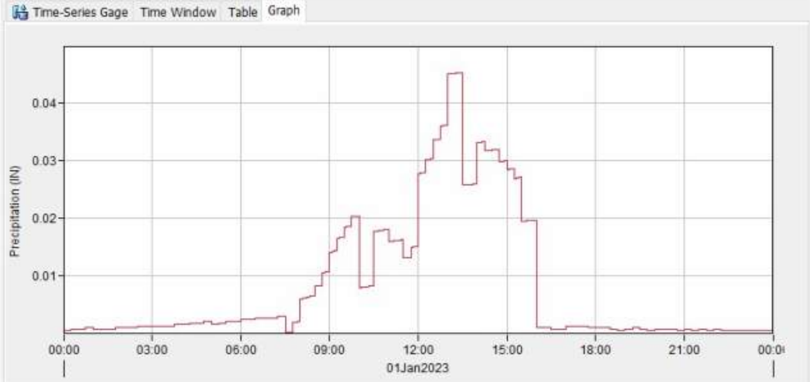
Time-Series Gage

Gage Name: 100-yr 24-hr
Description:
Data Source: Manual Entry
Units: Incremental Inches
Time Interval: 5 Minutes
Latitude Degrees:
Longitude Degrees:

Time-Series Gage | **Time Window** | Table | Graph

Gage Name: 100-yr 24-hr
*Start Date (ddMMMYYYY) 01Jan2023
*Start Time (HH:mm) 00:00
*End Date (ddMMMYYYY) 02Jan2023
*End Time (HH:mm) 00:00

Time-Series Gage | Time Window | Table | **Graph**



Project: UNT_Mission_Canyon_Hydrology
Simulation Run: 100-YR 24-HR
Simulation Start: 31 December 2022, 24:00
Simulation End: 1 January 2023, 24:00

HMS Version: 4.11
Executed: 02 January 2024, 15:24

Global Parameter Summary - Subbasin

Area (MI2)

Element Name	Area (MI2)
Subbasin - 1	2.19

Transform: Scs

Element Name	Lag	Unitgraph Type
Subbasin - 1	45.84	Standard

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin - 1	2.19	622.09	01Jan2023, 13:55	2.35

Subbasin: Subbasin-1

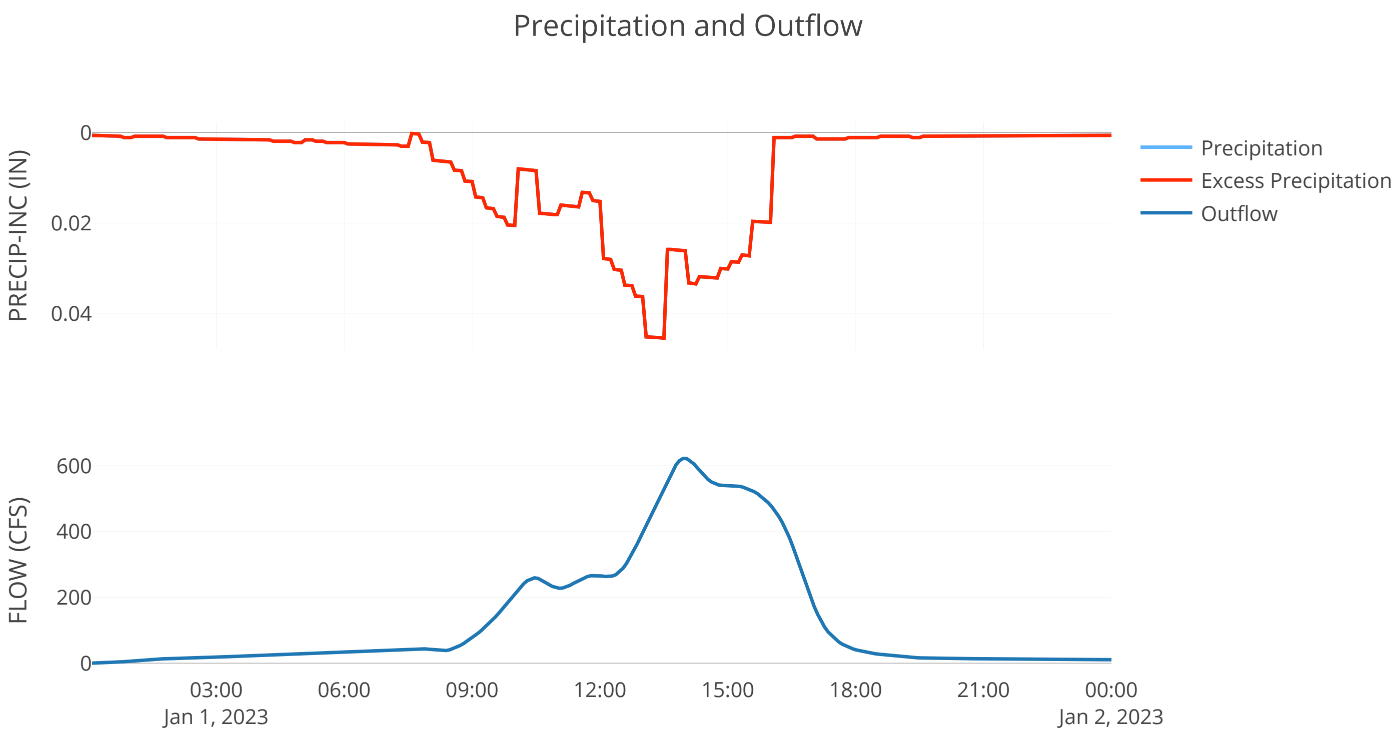
Area (MI2) : 2.19

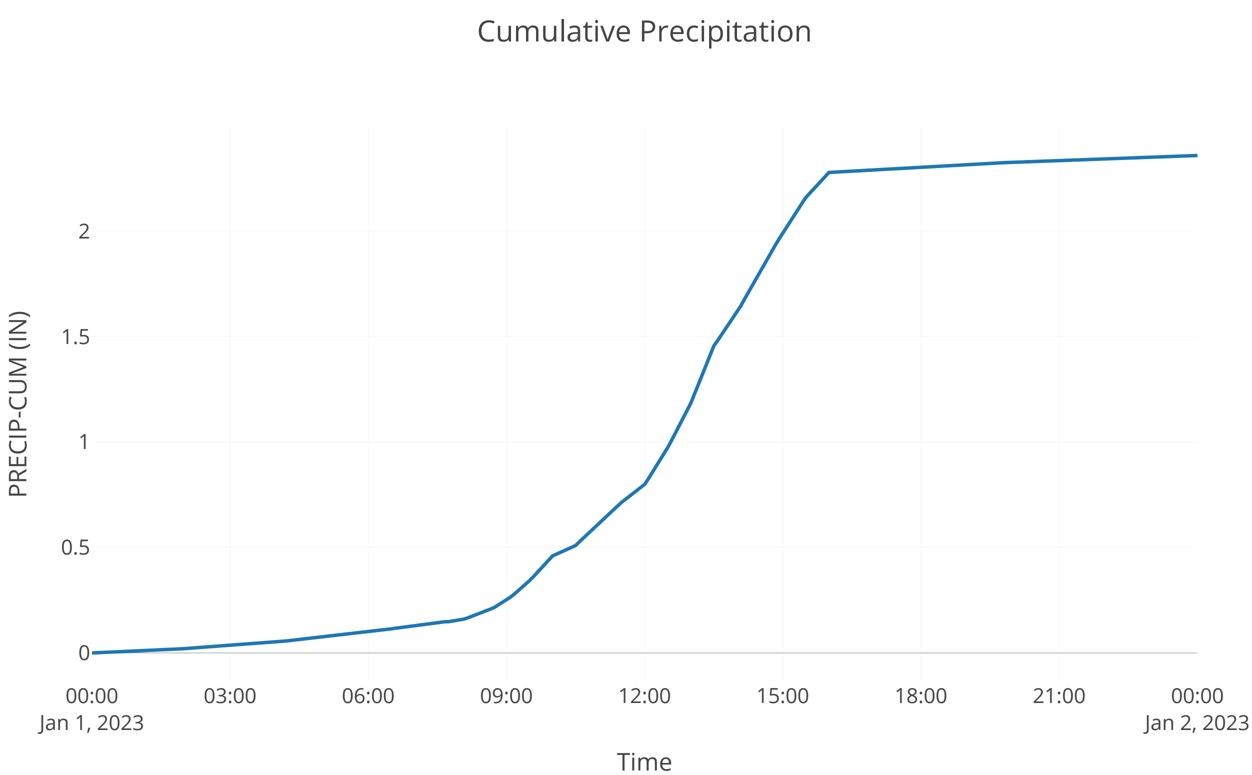
Transform: Scs

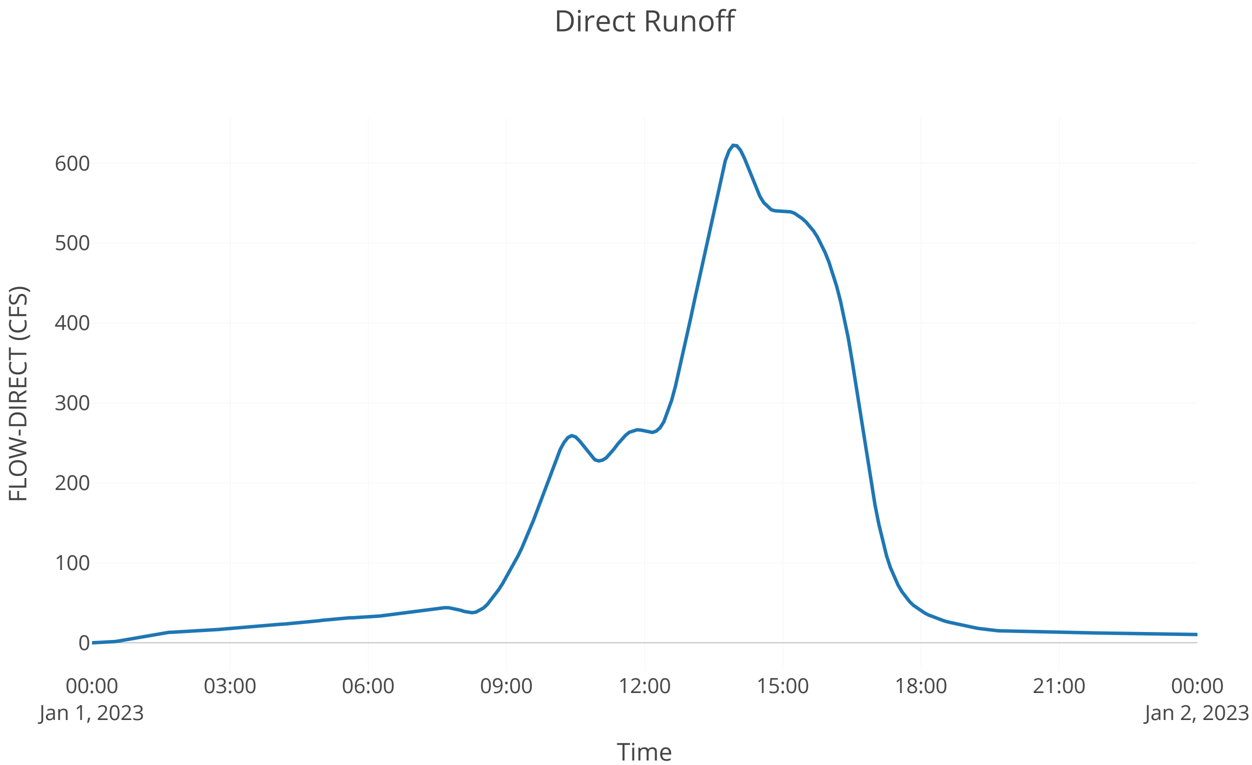
Lag	45.84
Unitgraph Type	Standard

Results: Subbasin-1

Peak Discharge (CFS)	622.09
Time of Peak Discharge	01Jan2023, 13:55
Volume (IN)	2.35
Precipitation Volume (AC - FT)	275.4
Loss Volume (AC - FT)	0
Excess Volume (AC - FT)	275.4
Direct Runoff Volume (AC - FT)	274.56
Baseflow Volume (AC - FT)	0


Precipitation and Outflow
PRECIP-INC (IN)
0
0.02
0.04
Precipitation
Excess Precipitation
Outflow
FLOW (CFS)
600
400
200
0
03:00
Jan 1, 2023
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Jan 2, 2023


Cumulative Precipitation
PRECIP-CUM (IN)
2
1.5
1
0.5
0
00:00
Jan 1, 2023
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Jan 2, 2023
Time


Direct Runoff
FLOW-DIRECT (CFS)
0
100
200
300
400
500
600
00:00
Jan 1, 2023
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Jan 2, 2023
Time

Appendix B

Model Input Data

Model Set 1 Roughness Coefficients (n-values)

RS 0.023
L: 0.021
About 50% asphalt(0.016), 25% smooth earth road (0.018), and about 25% grass (0.035)
C: 0.03
Earth channel. Weedy
R: 0.035
Mostly sand with grass

RS 0.038
L: 0.026
About 50% grass (0.035), 30% asphalt (0.016), and 20% smooth earth road (0.018)
C: 0.03
Earth channel. Weedy
R: 0.027
Half smooth earth (0.018) and half grass (0.035)

RS 0.042
L: 0.042
33% Heavy Brush (0.075), 33% grass (0.035), and 33% asphalt (0.016)
C: 0.03
Earth channel. Weedy
R: 0.04
Mostly light brush and sand with grass

RS 0.092
L: 0.022
Mostly smooth earth with some light brush
C: 0.03
Earth channel. Weedy
R: 0.025
Mostly smooth earth with some light brush and grass

RS 0.098
L: 0.044
80% smooth earth (0.035), 20% trees (0.15)
C: 0.03
Earth channel. Weedy
R: 0.048
60% Smooth earth (0.018), 20% grass (0.035), and 20% trees (0.15)

RS 0.147
L: 0.1
Proposed Site
C: 0.03
Earth channel. Weedy

R: 0.042
Grass and light brush

RS 0.159
L: 0.1
Proposed Site
C: 0.03
Earth channel. Weedy
R: 0.042
Grass and light brush

RS 0.170
L: 0.1
Proposed Site
C: 0.03
Earth channel. Weedy
R: 0.042
Grass and light brush

RS 0.186
L: 0.1
Proposed Site
C: 0.03
Earth channel. Weedy
R: 0.042
Grass and light brush

RS 0.199
L: 0.1
Proposed Site
C: 0.03
Earth channel. Weedy
R: 0.042
Grass and light brush

RS 0.267
L: 0.0526
70% Light Brush (0.05), 20% rock (0.08) and 10% asphalt (0.016)
C: 0.04
Earth channel. Weedy and rocky
R: 0.05
Light brush

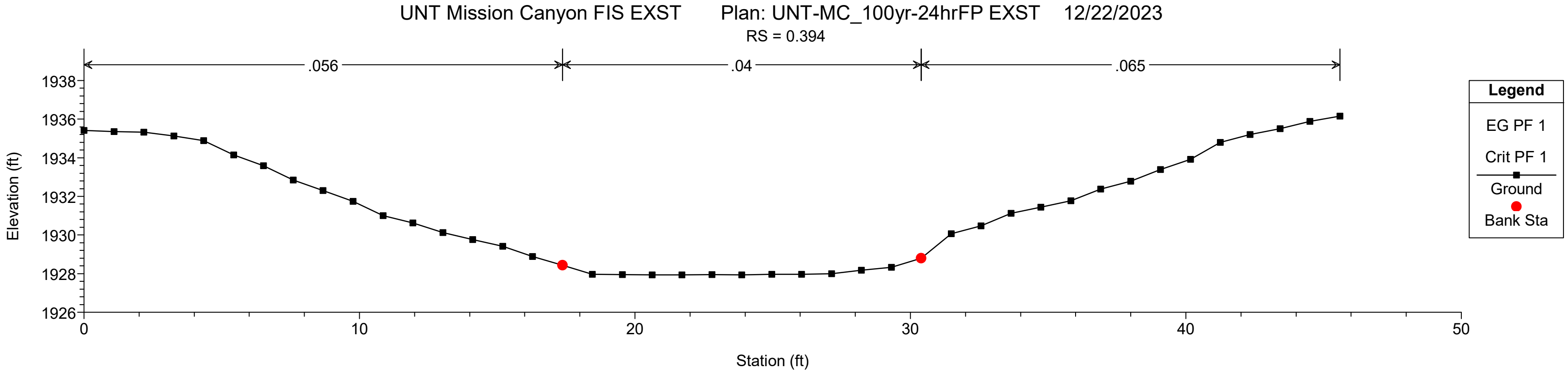
RS 0.319
L: 0.056
80% Light Brush (0.05) and 20% rock (0.08)
C: 0.04

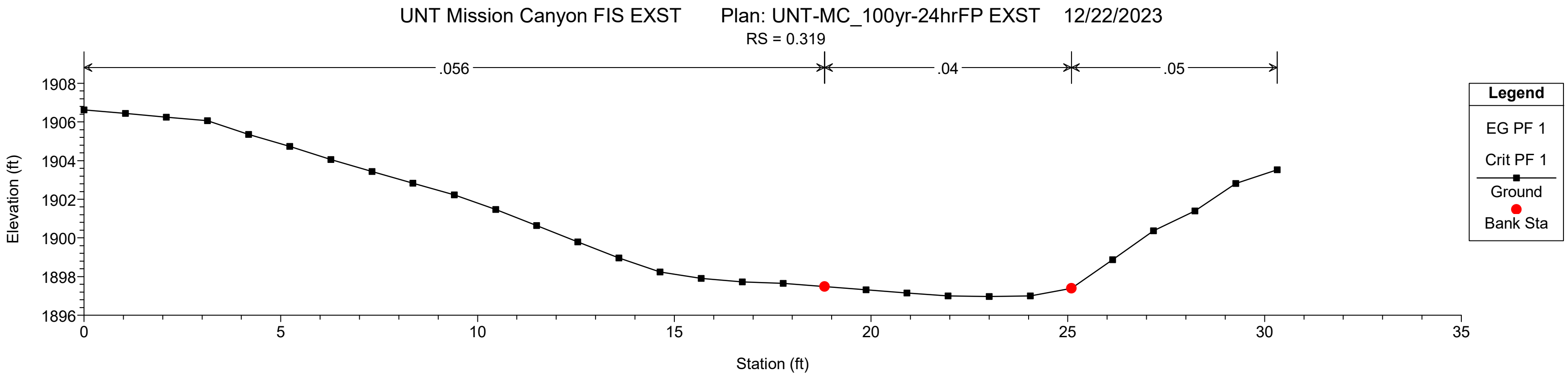
	Earth channel. Weedy and rocky
R:	0.05
	Light brush

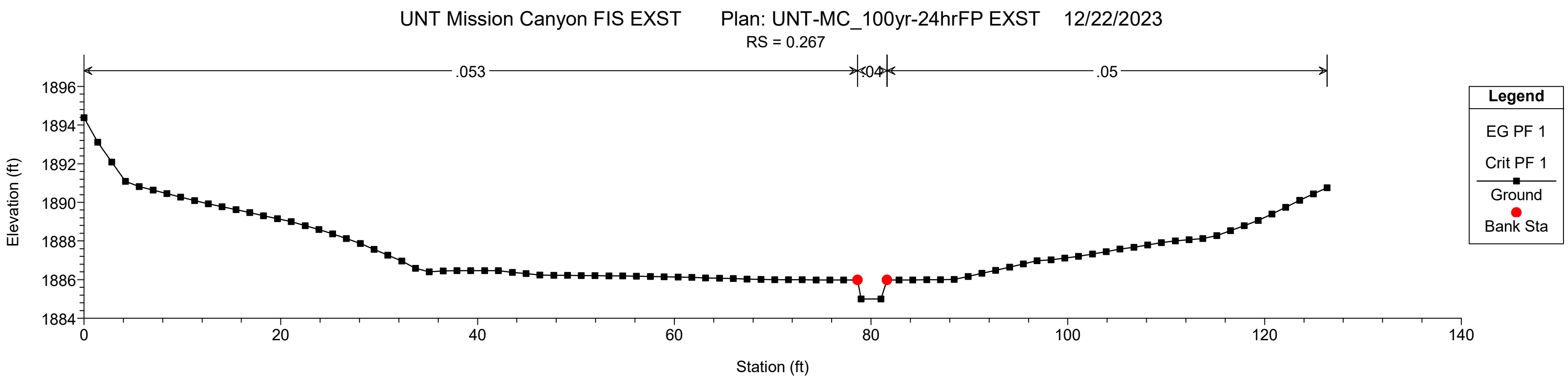
RS 0.394

L:	0.056
	40% light brush (0.05), 40% rock (0.08), 20% smooth earth road (0.018)
C:	0.04
	Earth channel. Weedy and rocky
R:	0.065
	50% light brush (0.05) and 50% rock (0.08)

CURENT CONDITIONS CROSS-SECTIONS







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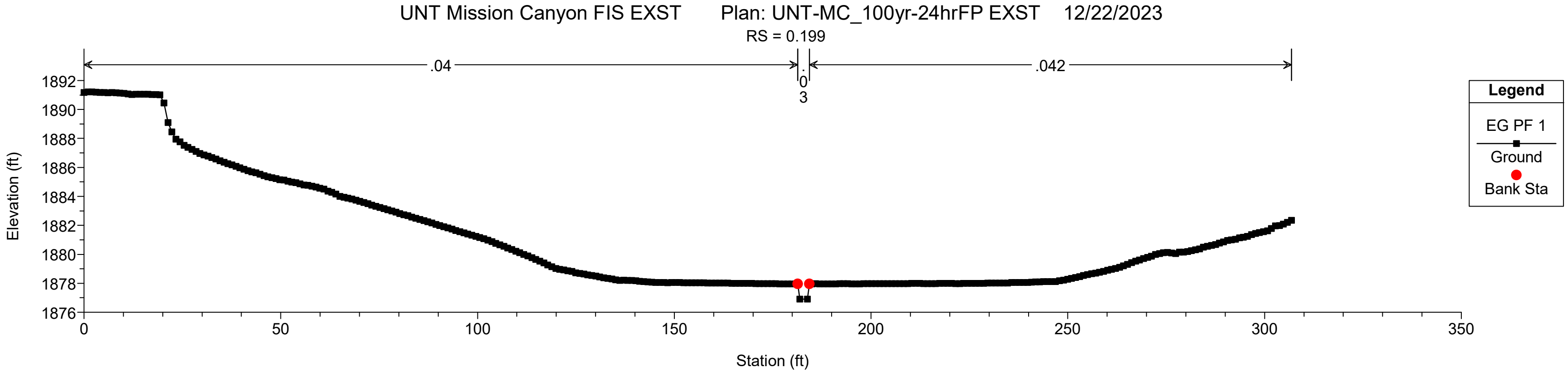

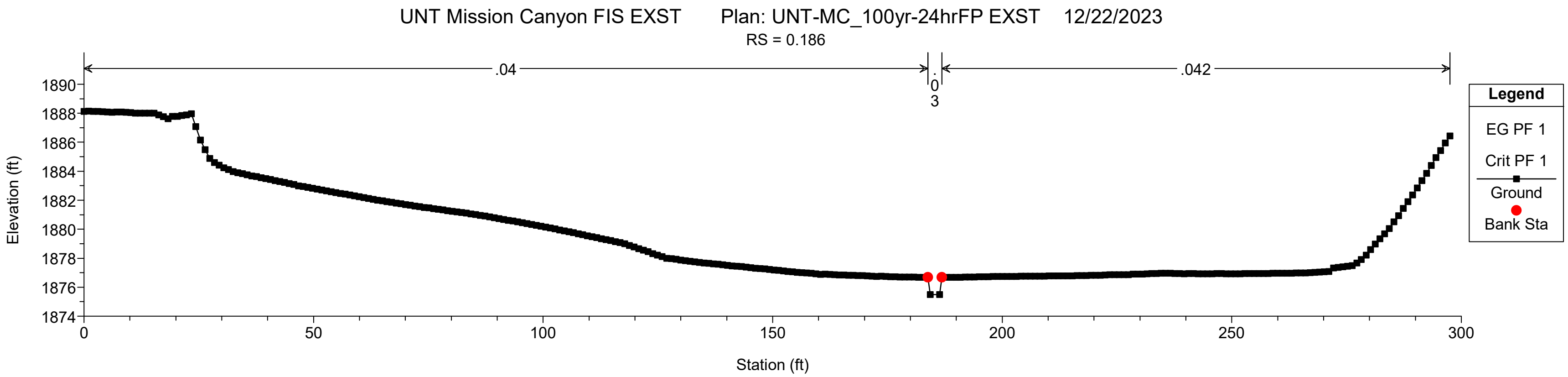

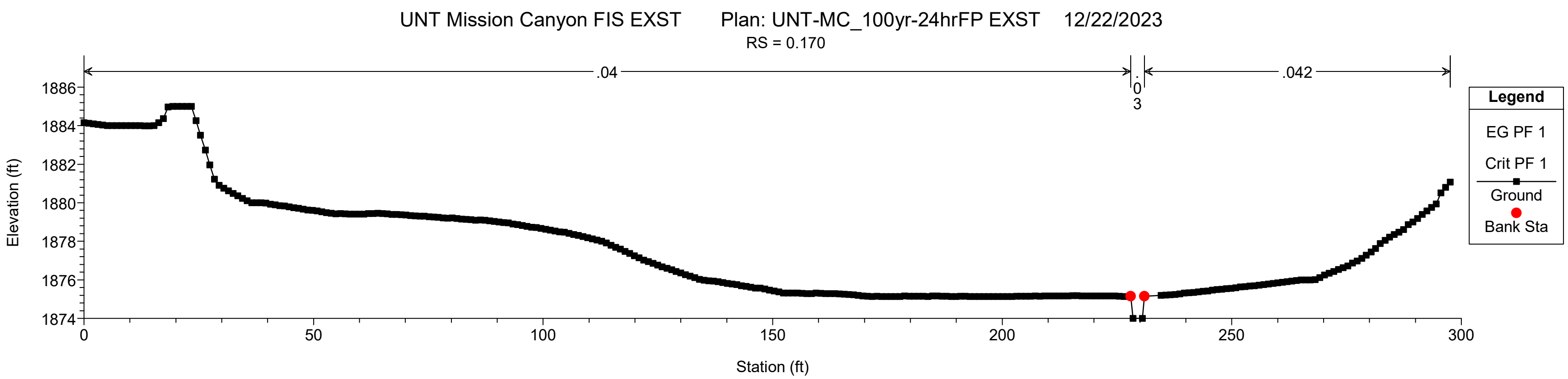

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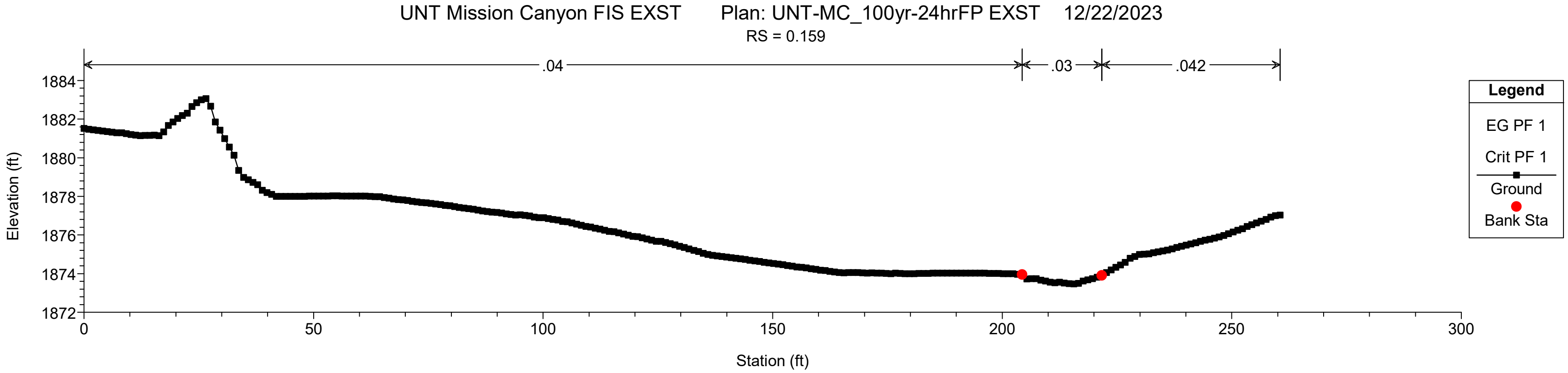
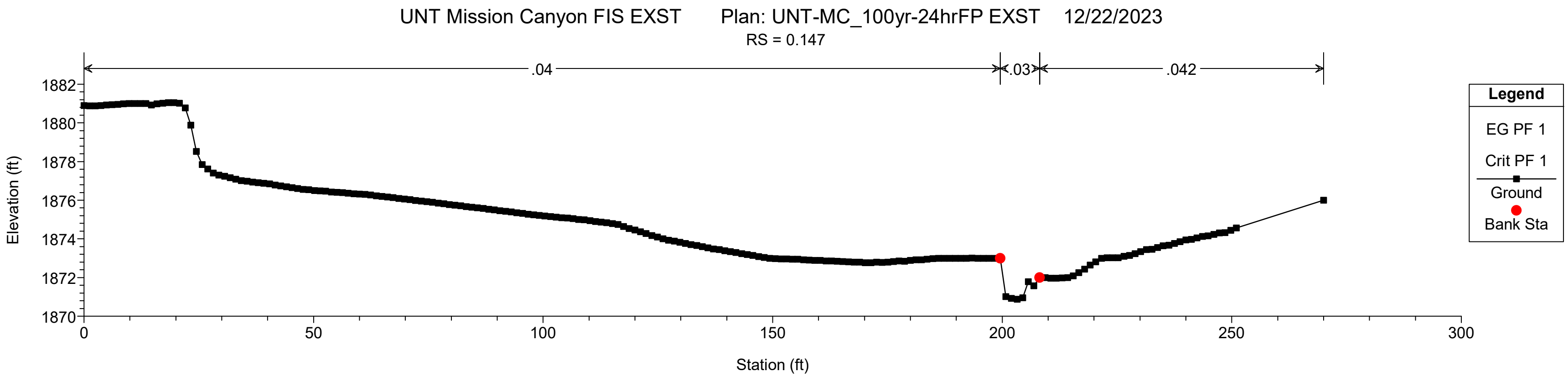
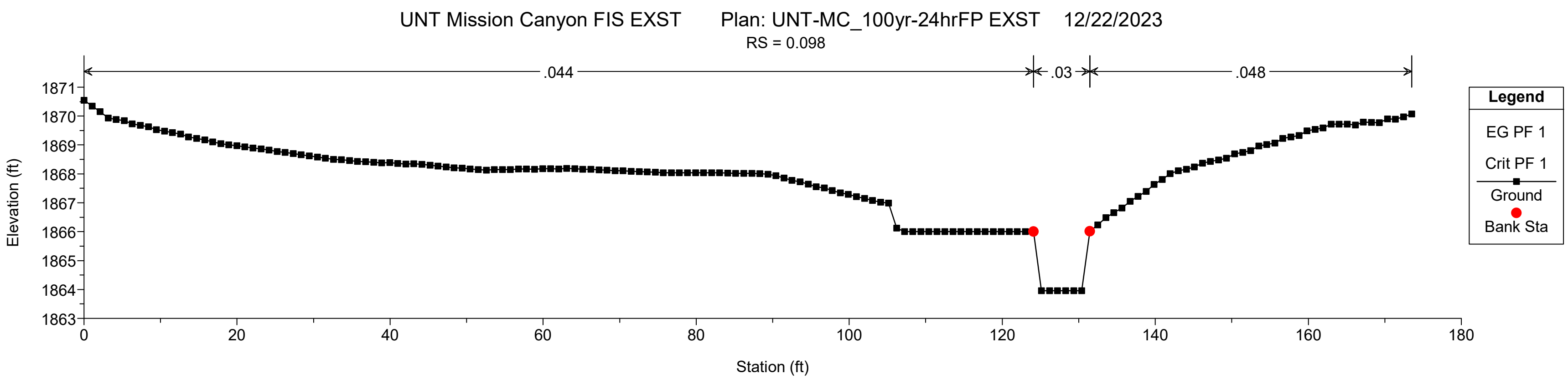
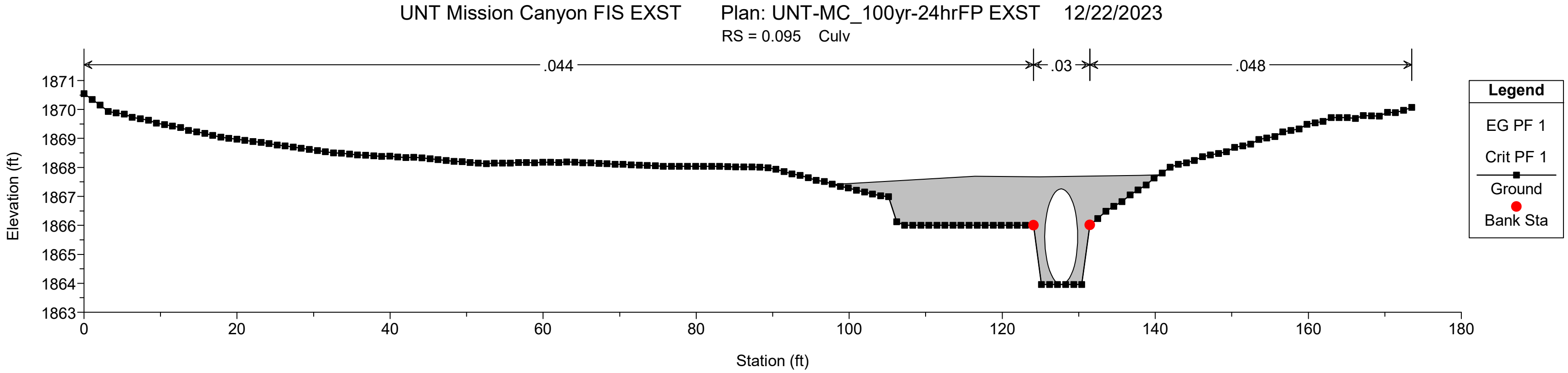
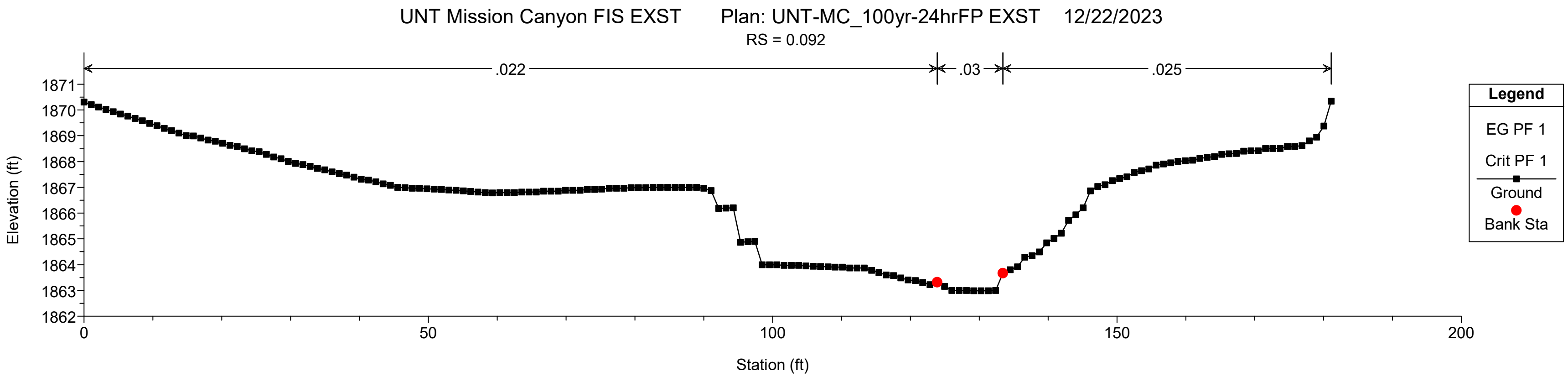


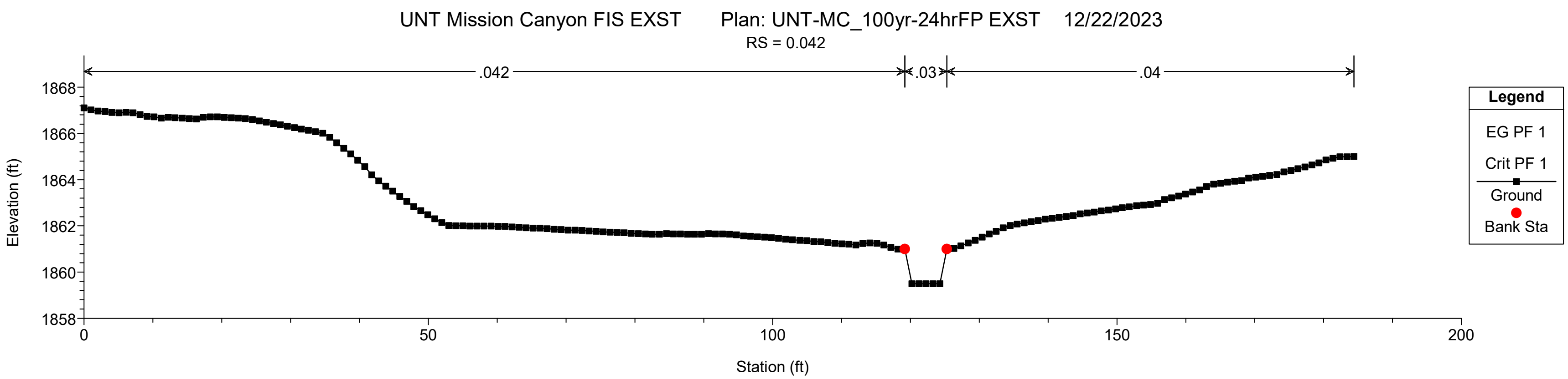




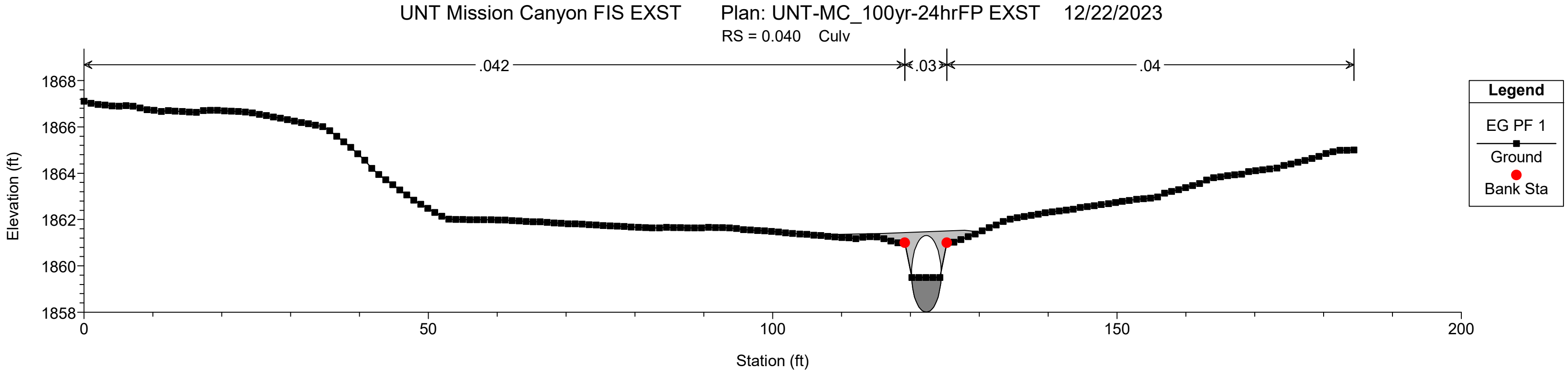
CURENT CONDITIONS CROSS-SECTIONS

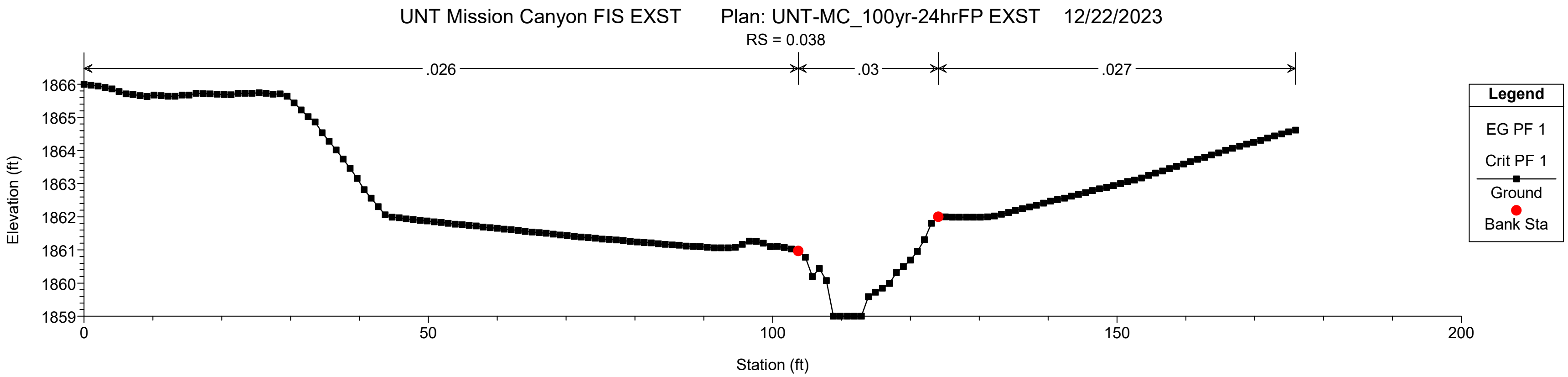


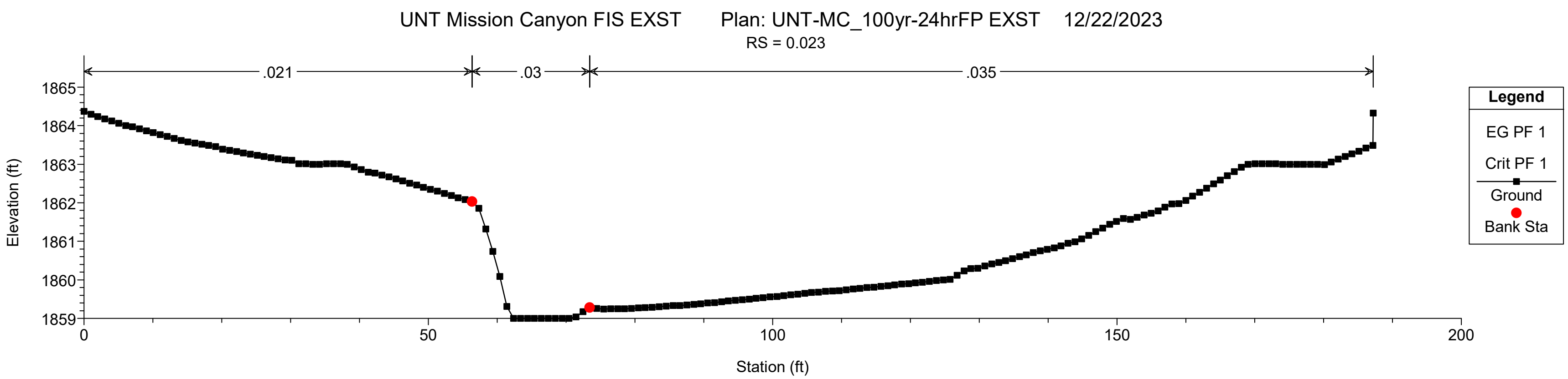




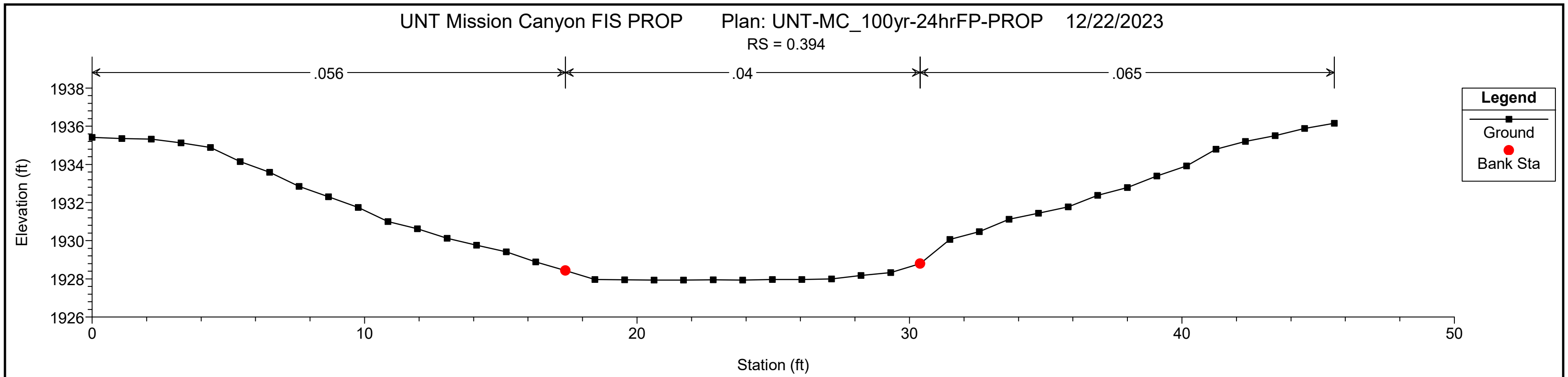
CURENT CONDITIONS CROSS-SECTIONS

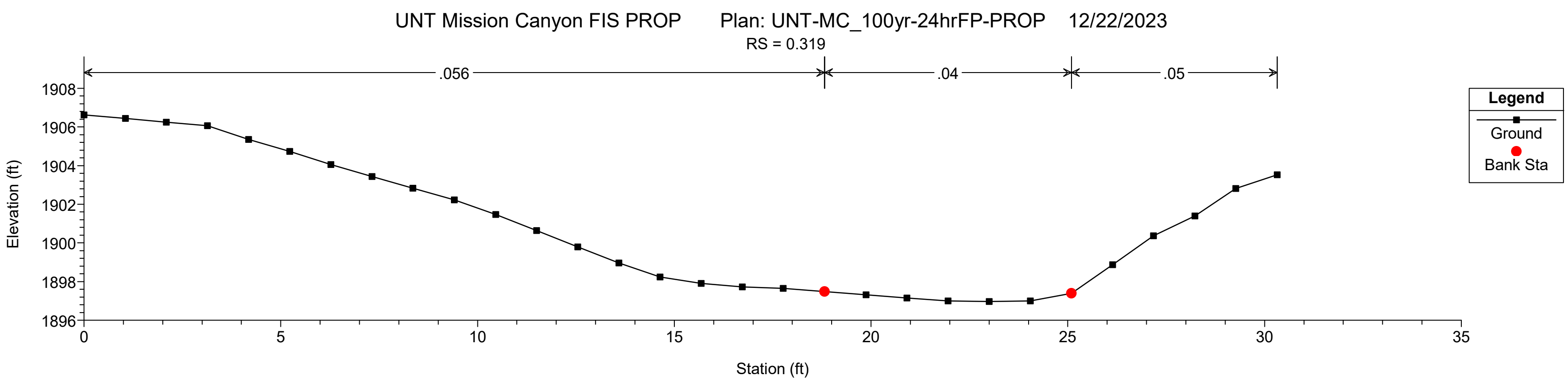


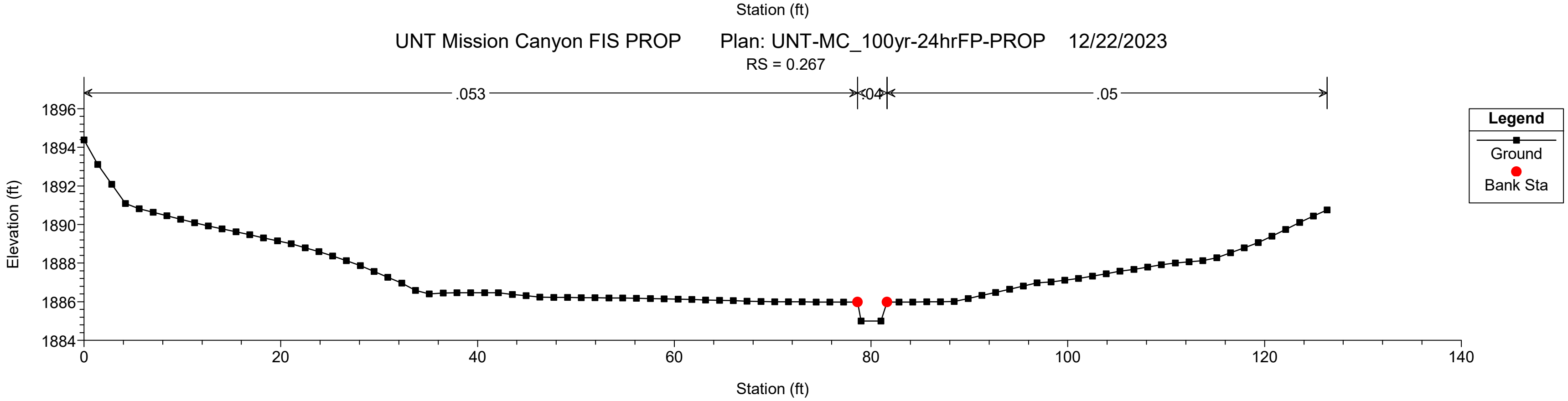




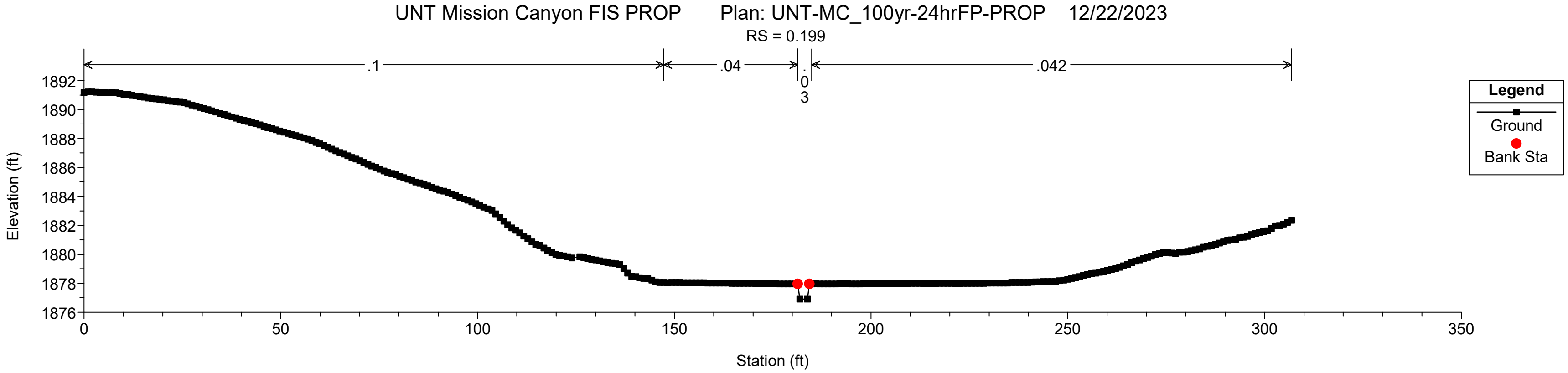
PROPOSED CONDITIONS CROSS-SECTIONS

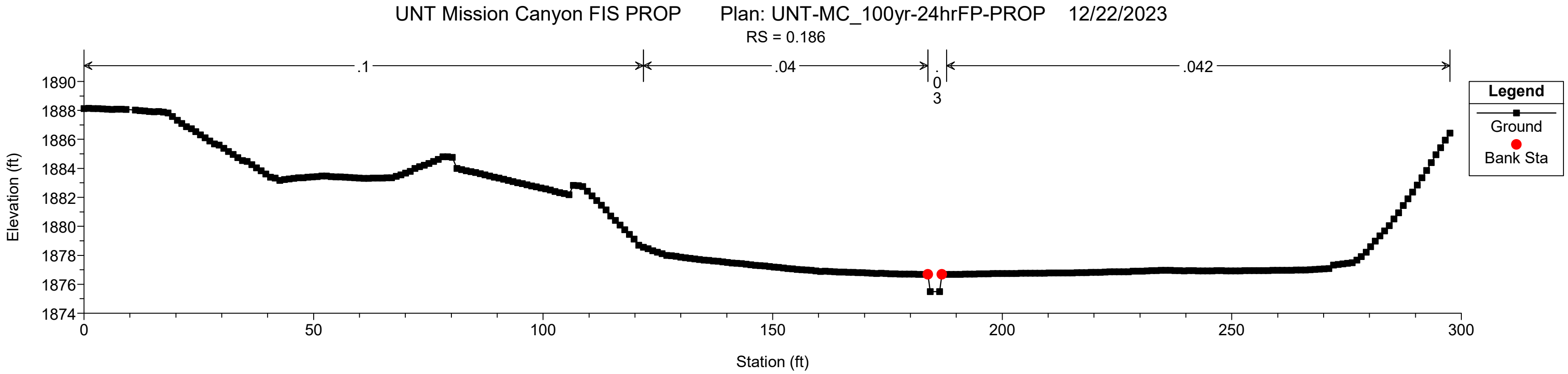


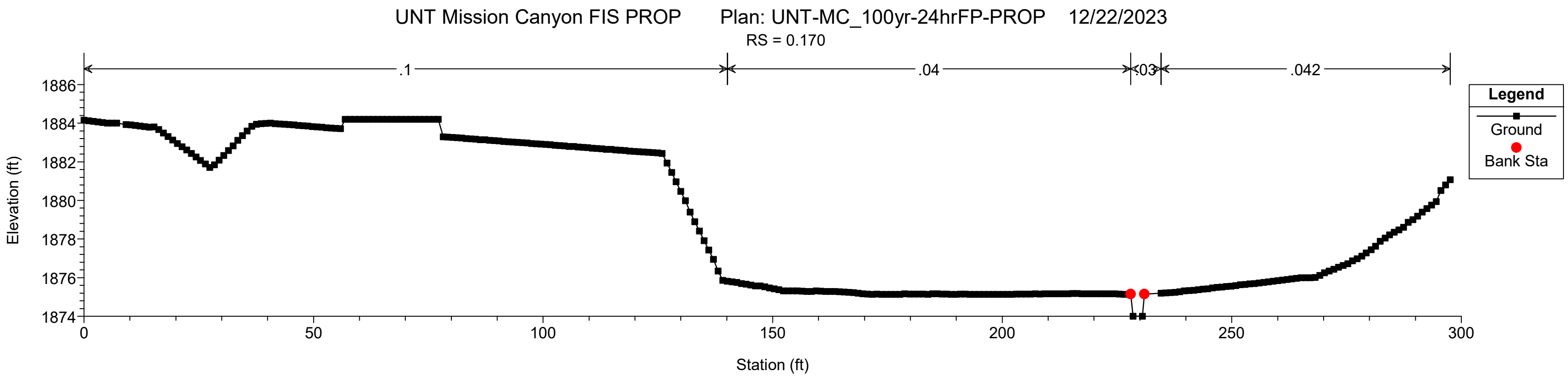




PROPOSED CONDITIONS CROSS-SECTIONS







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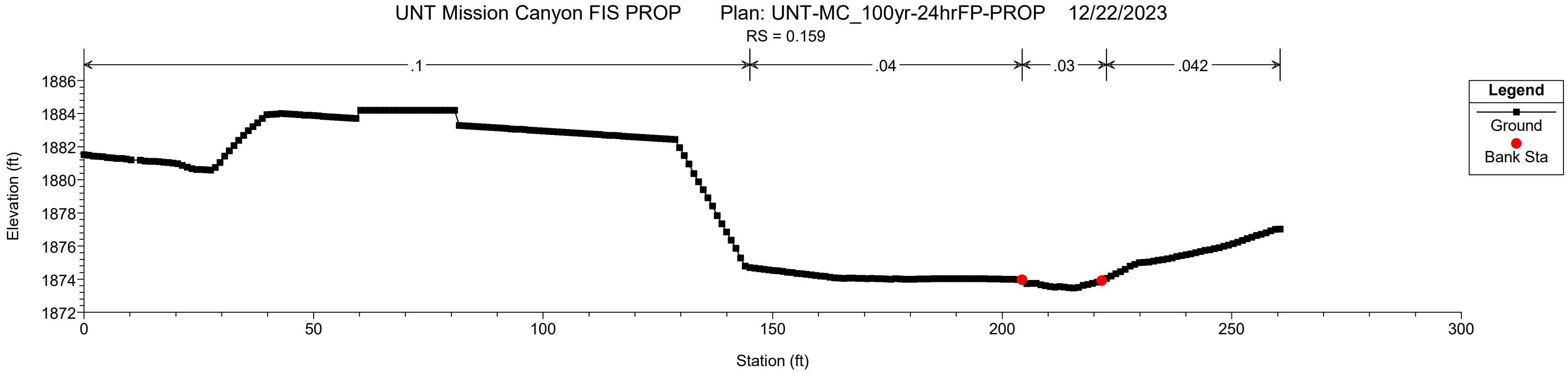
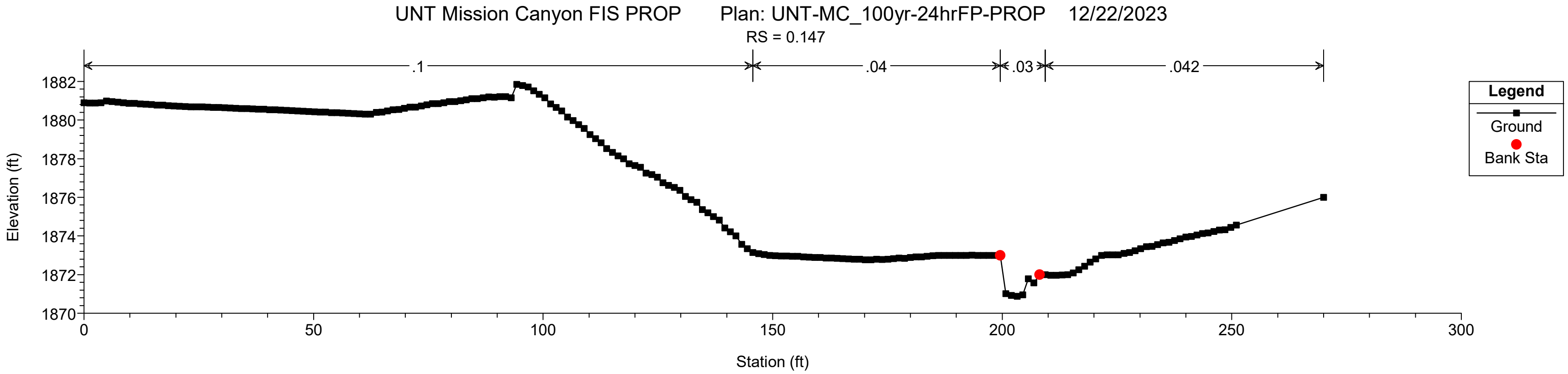
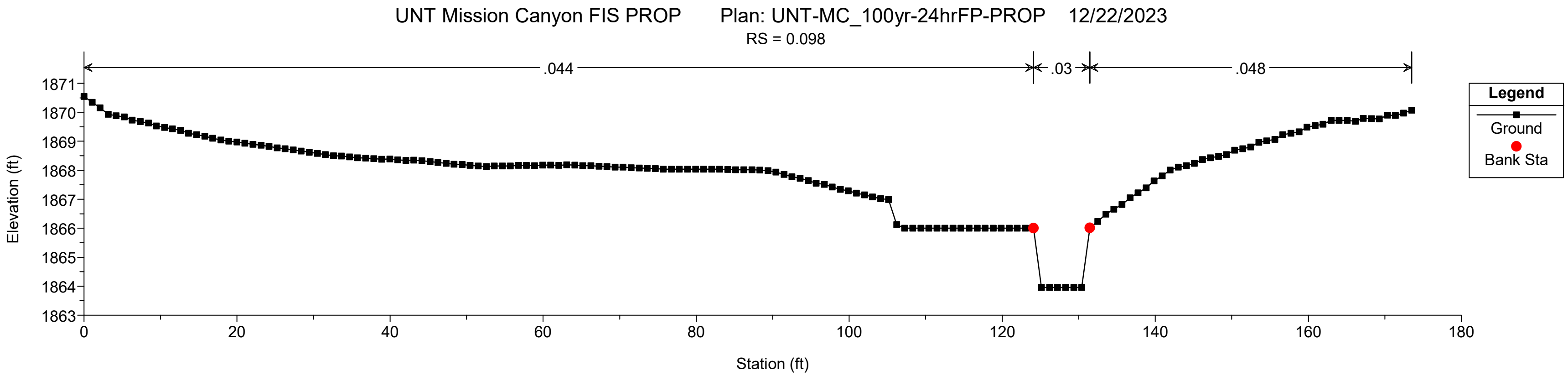
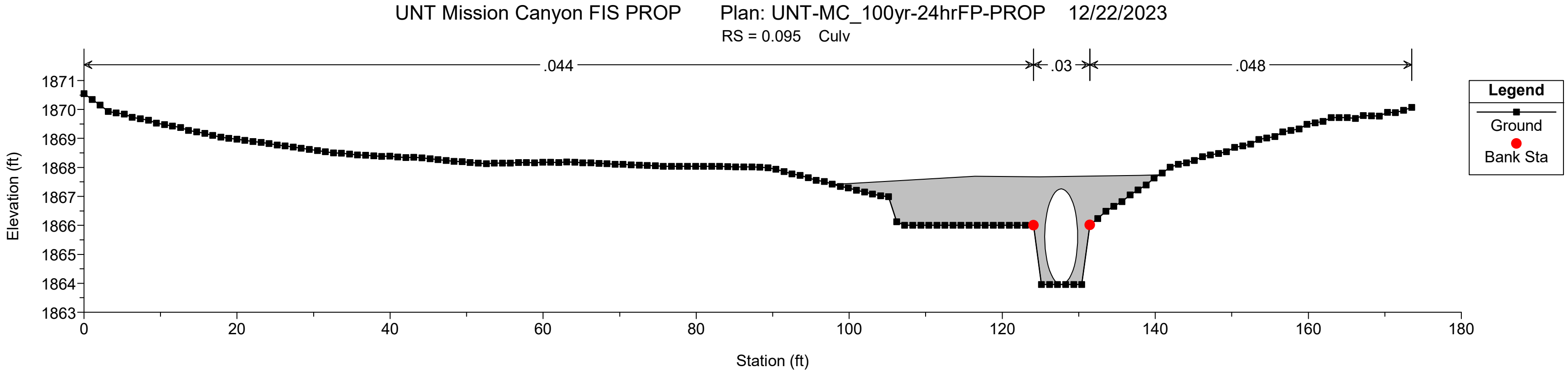
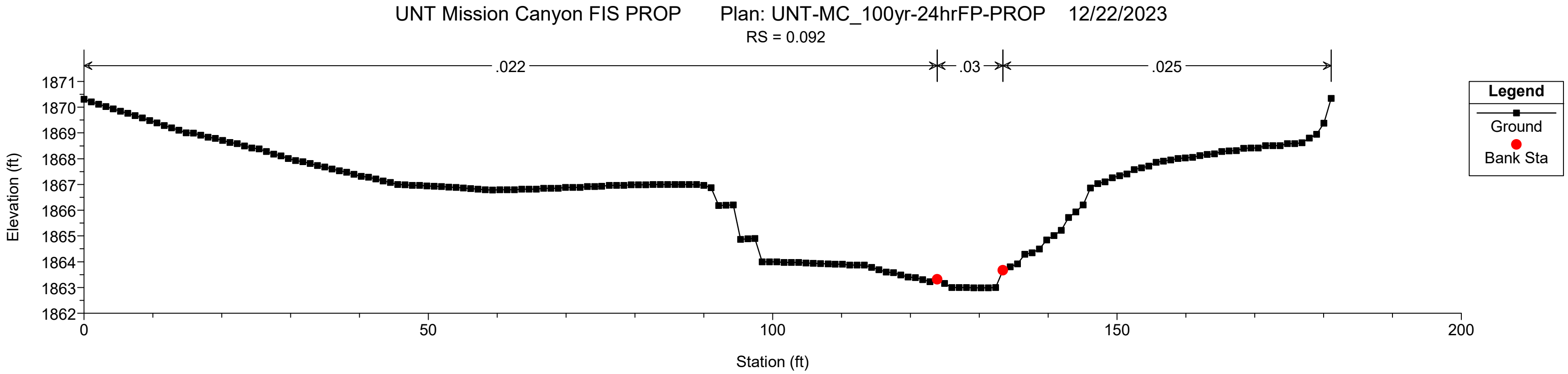


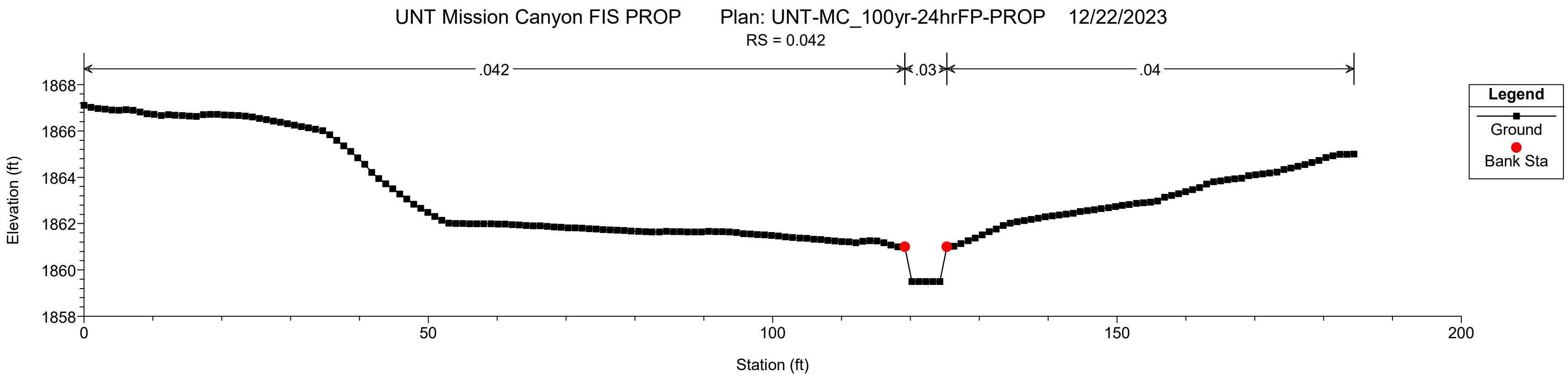




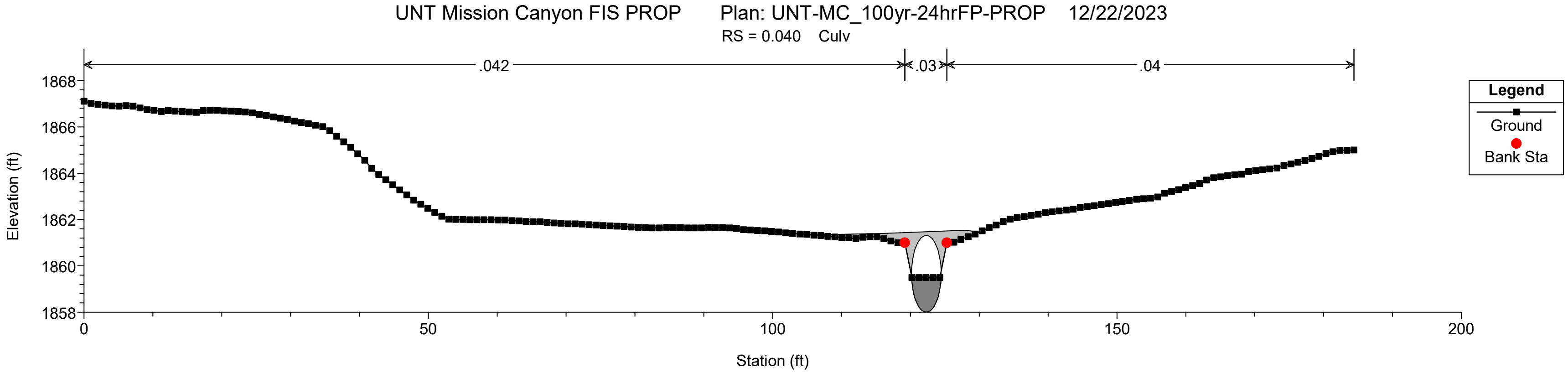
PROPOSED CONDITIONS CROSS-SECTIONS

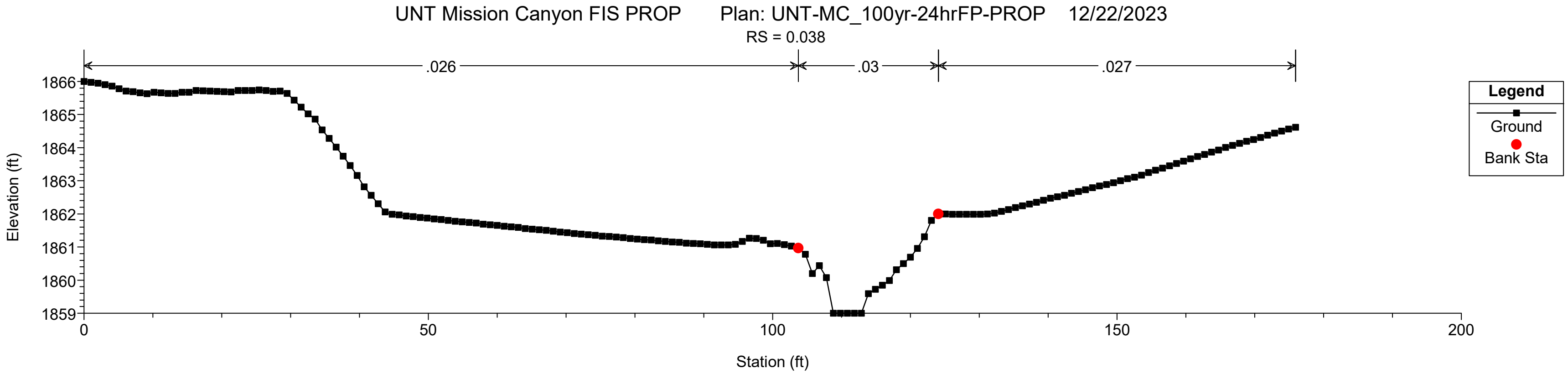


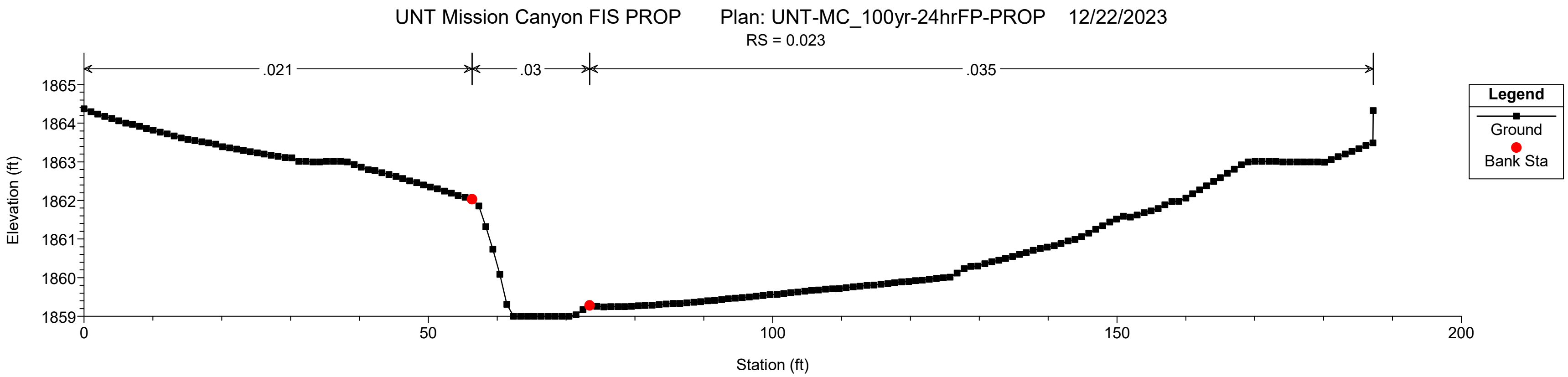


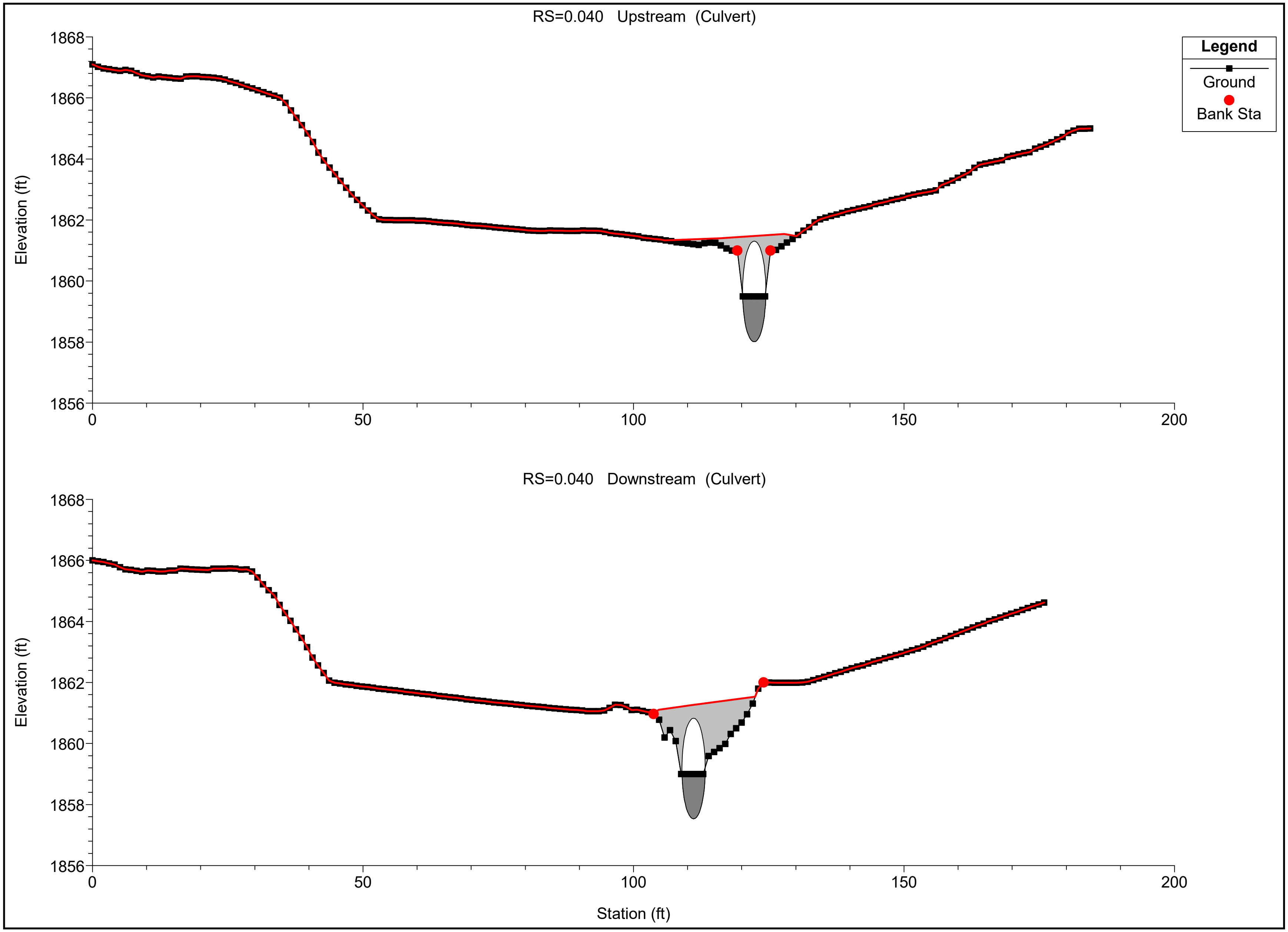


PROPOSED CONDITIONS CROSS-SECTIONS

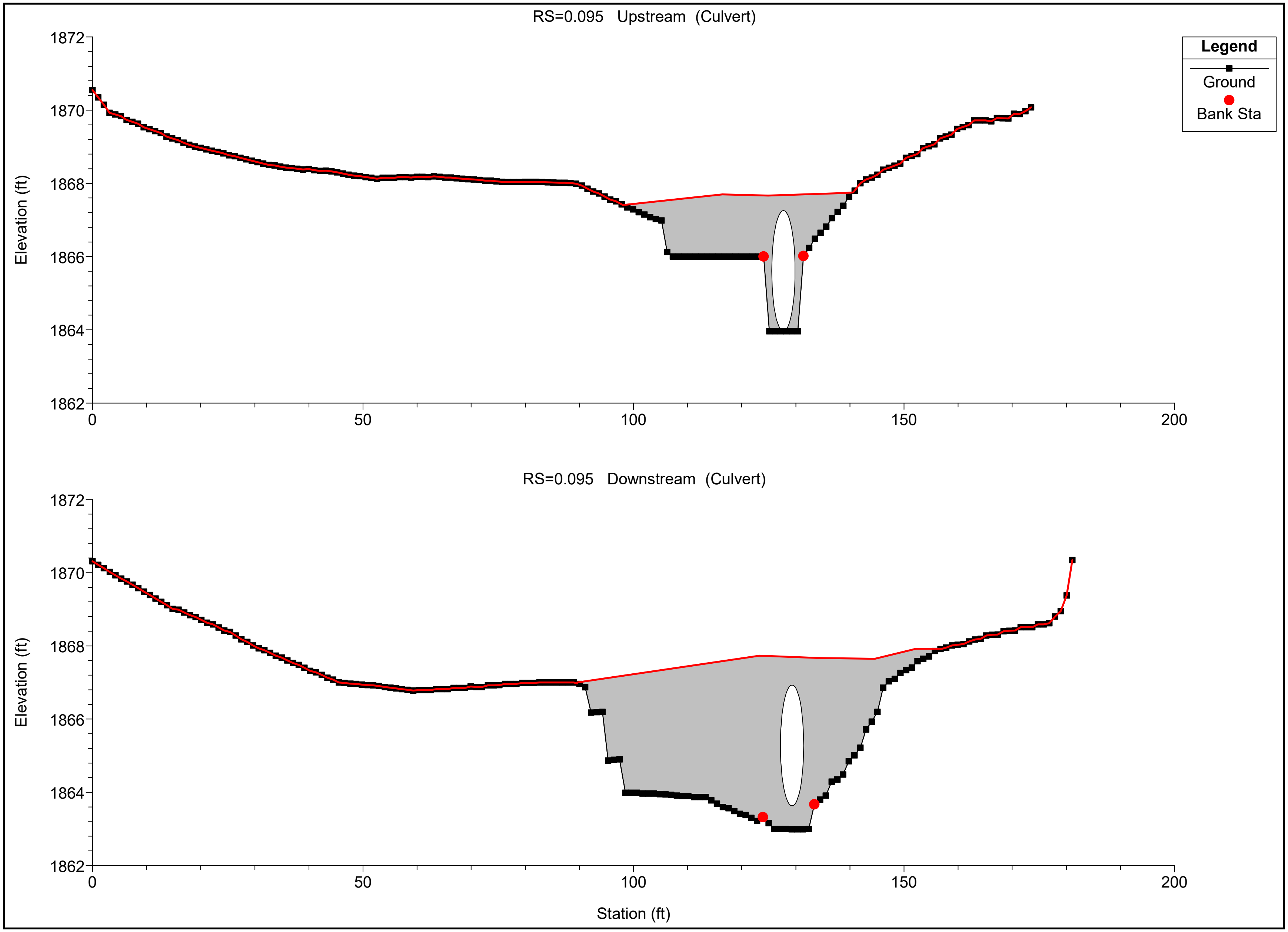




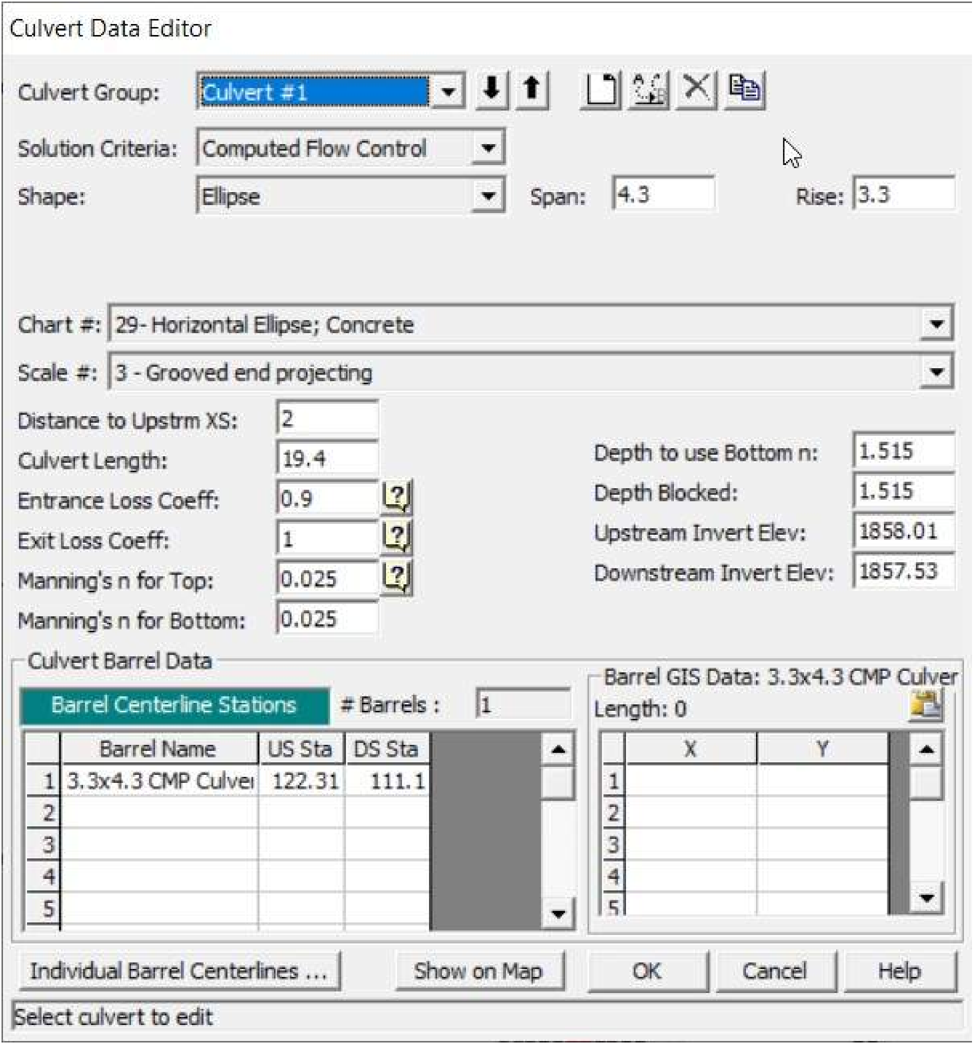


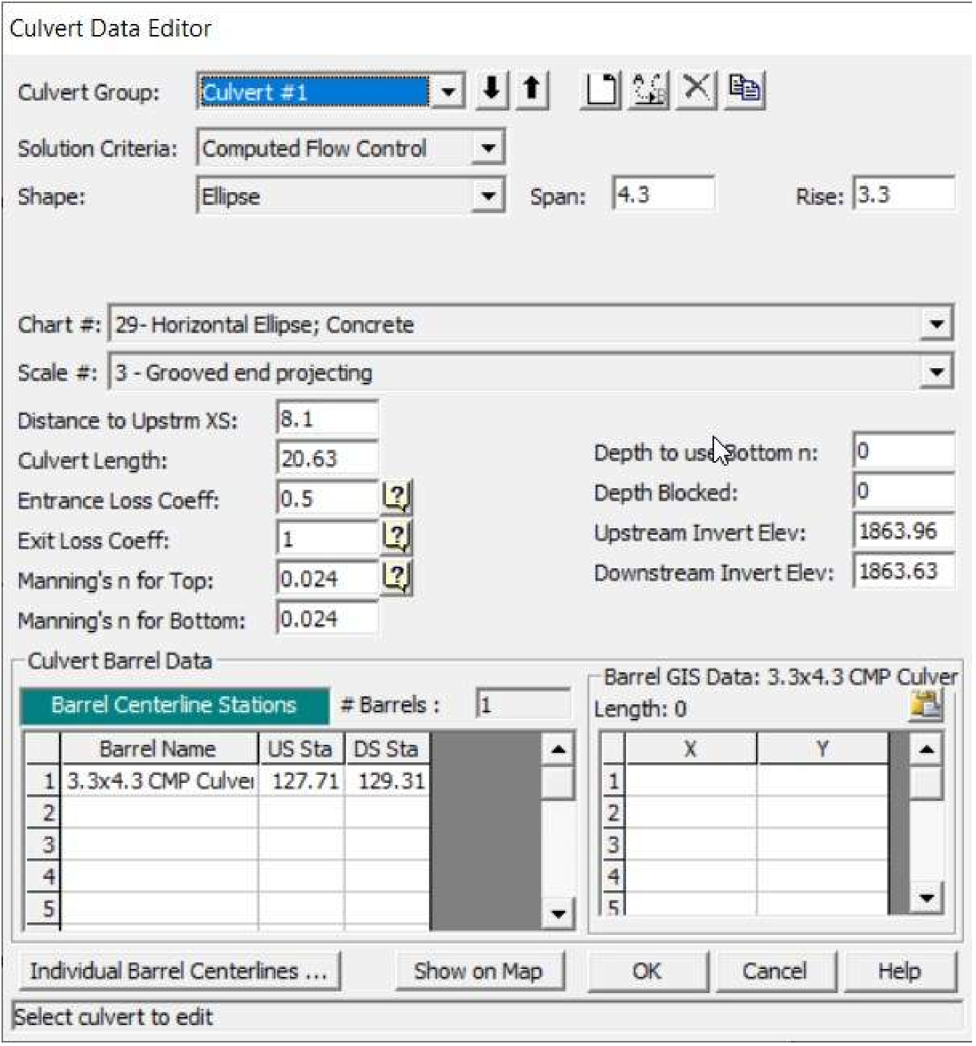


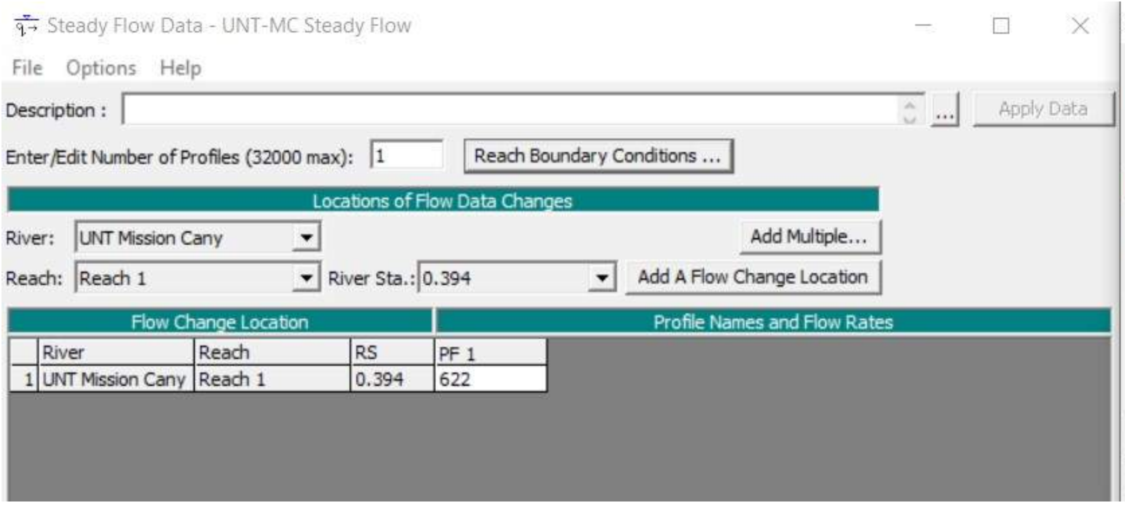
RS=0.040 Upstream (Culvert)
Legend
Ground
Bank Sta
Elevation (ft)
1868
1866
1864
1862
1860
1858
1856
0
50
100
150
200
RS=0.040 Downstream (Culvert)
Elevation (ft)
1868
1866
1864
1862
1860
1858
1856
0
50
100
150
200
Station (ft)

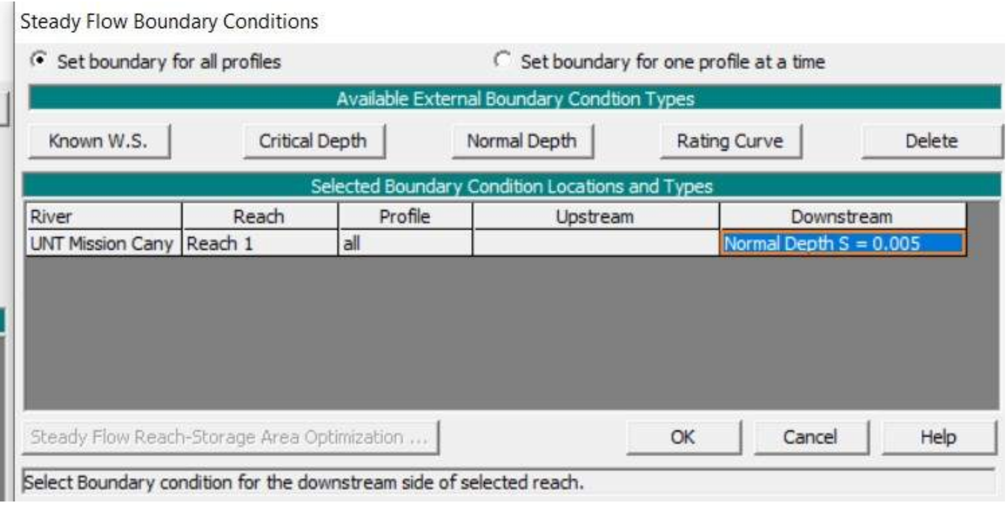


RS=0.095 Upstream (Culvert)
Legend
Ground
Bank Sta
Elevation (ft)
1872
1870
1868
1866
1864
1862
0
50
100
150
200
RS=0.095 Downstream (Culvert)
Elevation (ft)
1872
1870
1868
1866
1864
1862
0
50
100
150
200
Station (ft)


Culvert Data Editor
Culvert Group: Culvert #1
Solution Criteria: Computed Flow Control
Shape: Ellipse
Span: 4.3
Rise: 3.3
Chart #: 29- Horizontal Ellipse; Concrete
Scale #: 3 - Grooved end projecting
Distance to Upstrm XS: 2
Culvert Length: 19.4
Entrance Loss Coeff: 0.9
Exit Loss Coeff: 1
Manning's n for Top: 0.025
Manning's n for Bottom: 0.025
Depth to use Bottom n: 1.515
Depth Blocked: 1.515
Upstream Invert Elev: 1858.01
Downstream Invert Elev: 1857.53
Culvert Barrel Data
Barrel Centerline Stations
Barrels : 1
Barrel Name
US Sta
DS Sta
1 3.3x4.3 CMP Culvei 122.31 111.1
2
3
4
5
Barrel GIS Data: 3.3x4.3 CMP Culver
Length: 0
X
Y
1
2
3
4
5
Individual Barrel Centerlines ...
Show on Map
OK
Cancel
Help
Select culvert to edit


Culvert Data Editor
Culvert Group:
Culvert #1
Solution Criteria:
Computed Flow Control
Shape:
Ellipse
Span:
4.3
Rise:
3.3
Chart #:
29- Horizontal Ellipse; Concrete
Scale #:
3 - Grooved end projecting
Distance to Upstrm XS:
8.1
Culvert Length:
20.63
Entrance Loss Coeff:
0.5
Exit Loss Coeff:
1
Manning's n for Top:
0.024
Manning's n for Bottom:
0.024
Depth to use Bottom n:
0
Depth Blocked:
0
Upstream Invert Elev:
1863.96
Downstream Invert Elev:
1863.63
Culvert Barrel Data
Barrel Centerline Stations
Barrels :
1
Barrel Name
US Sta
DS Sta
3.3x4.3 CMP Culvei
127.71
129.31
Barrel GIS Data: 3.3x4.3 CMP Culver
Length: 0
X
Y
Individual Barrel Centerlines ...
Show on Map
OK
Cancel
Help
Select culvert to edit

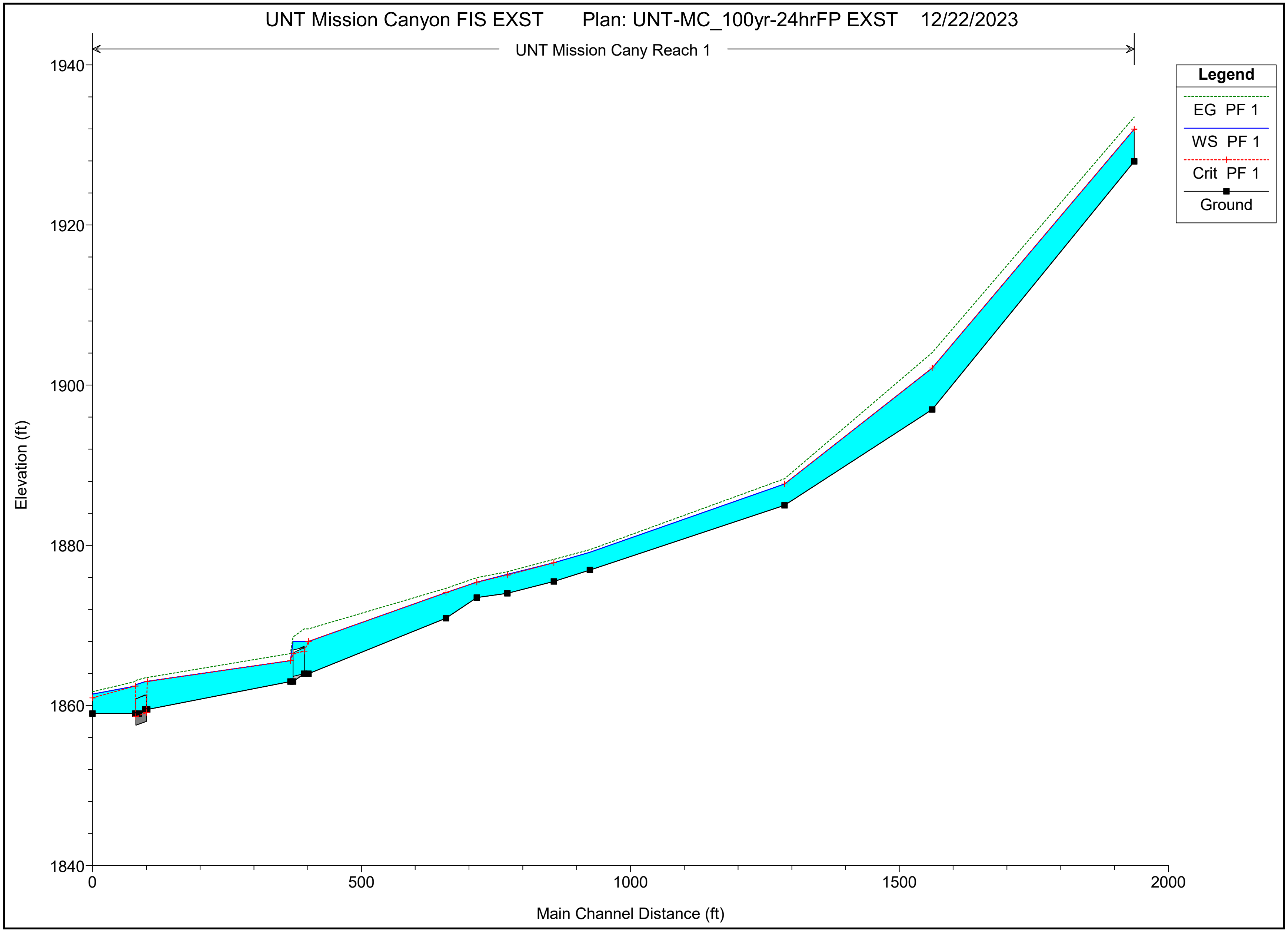

Steady Flow Data - UNT-MC Steady Flow
File Options Help
Description :
Apply Data
Enter/Edit Number of Profiles (32000 max): 1
Reach Boundary Conditions ...
Locations of Flow Data Changes
River: UNT Mission Cany
Add Multiple...
Reach: Reach 1
River Sta.: 0.394
Add A Flow Change Location
Flow Change Location
Profile Names and Flow Rates
River
Reach
RS
PF 1
1
UNT Mission Cany
Reach 1
0.394
622


Steady Flow Boundary Conditions
Set boundary for all profiles
Set boundary for one profile at a time
Available External Boundary Condtion Types
Known W.S.
Critical Depth
Normal Depth
Rating Curve
Delete
Selected Boundary Condition Locations and Types
River
Reach
Profile
Upstream
Downstream
UNT Mission Cany
Reach 1
all
Normal Depth S = 0.005
Steady Flow Reach-Storage Area Optimization ...
OK
Cancel
Help
Select Boundary condition for the downstream side of selected reach.

Appendix C

Model Set 1 Output Data

CURRENT CONDITIONS PROFILE



MODEL SET 1

CURRENT CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC100yr24hrFP_EXST   UNT Mission Cany   Reach 1 RS: 0.394   Profile: PF 1

E.G. Elev (ft)	1933.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.51	Wt. n-Val.	0.056	0.040	0.065
W.S. Elev (ft)	1931.98	Reach Len. (ft)	391.50	375.30	367.30
Crit W.S. (ft)	1931.98	Flow Area (sq ft)	15.22	51.06	7.12
E.G. Slope (ft/ft)	0.013208	Area (sq ft)	15.22	51.06	7.12
Q Total (cfs)	622.00	Flow (cfs)	66.63	536.05	19.32
Top Width (ft)	26.88	Top Width (ft)	8.06	13.02	5.80
Vel Total (ft/s)	8.47	Avg. Vel. (ft/s)	4.38	10.50	2.71
Max Chl Dpth (ft)	4.04	Hydr. Depth (ft)	1.89	3.92	1.23
Conv. Total (cfs)	5412.2	Conv. (cfs)	579.8	4664.4	168.1
Length Wtd. (ft)	378.08	Wetted Per. (ft)	8.84	13.24	6.79
Min Ch El (ft)	1927.94	Shear (lb/sq ft)	1.42	3.18	0.87
Alpha	1.35	Stream Power (lb/ft s)	6.21	33.39	2.35
Frctn Loss (ft)	5.26	Cum Volume (acre-ft)	2.34	1.20	1.32
C & E Loss (ft)	0.04	Cum SA (acres)	1.95	0.32	1.32

Plan: UNTMC100yr24hrFP_EXST   UNT Mission Cany   Reach 1 RS: 0.319   Profile: PF 1

E.G. Elev (ft)	1904.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.92	Wt. n-Val.	0.056	0.040	0.050
W.S. Elev (ft)	1902.16	Reach Len. (ft)	276.20	274.80	282.60
Crit W.S. (ft)	1902.16	Flow Area (sq ft)	28.43	31.43	8.41
E.G. Slope (ft/ft)	0.014662	Area (sq ft)	28.43	31.43	8.41
Q Total (cfs)	622.00	Flow (cfs)	174.99	409.29	37.72
Top Width (ft)	19.27	Top Width (ft)	9.31	6.27	3.69
Vel Total (ft/s)	9.11	Avg. Vel. (ft/s)	6.16	13.02	4.48
Max Chl Dpth (ft)	5.19	Hydr. Depth (ft)	3.05	5.01	2.28
Conv. Total (cfs)	5136.8	Conv. (cfs)	1445.1	3380.1	311.5
Length Wtd. (ft)	276.53	Wetted Per. (ft)	10.72	6.38	6.05
Min Ch El (ft)	1896.97	Shear (lb/sq ft)	2.43	4.51	1.27
Alpha	1.49	Stream Power (lb/ft s)	14.94	58.71	5.71
Frctn Loss (ft)	5.71	Cum Volume (acre-ft)	2.14	0.85	1.26
C & E Loss (ft)	0.38	Cum SA (acres)	1.87	0.24	1.28

Plan: UNTMC100yr24hrFP_EXST   UNT Mission Cany   Reach 1 RS: 0.267   Profile: PF 1

E.G. Elev (ft)	1888.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.053	0.040	0.050
W.S. Elev (ft)	1887.66	Reach Len. (ft)	356.90	361.50	389.60
Crit W.S. (ft)	1887.66	Flow Area (sq ft)	68.40	7.48	24.91
E.G. Slope (ft/ft)	0.031188	Area (sq ft)	68.40	7.48	24.91
Q Total (cfs)	622.00	Flow (cfs)	419.02	72.01	130.97
Top Width (ft)	77.32	Top Width (ft)	49.55	3.00	24.77
Vel Total (ft/s)	6.17	Avg. Vel. (ft/s)	6.13	9.62	5.26
Max Chl Dpth (ft)	2.66	Hydr. Depth (ft)	1.38	2.49	1.01
Conv. Total (cfs)	3522.1	Conv. (cfs)	2372.7	407.8	741.6
Length Wtd. (ft)	369.52	Wetted Per. (ft)	49.70	4.21	24.85
Min Ch El (ft)	1885.00	Shear (lb/sq ft)	2.68	3.46	1.95
Alpha	1.10	Stream Power (lb/ft s)	16.42	33.28	10.26
Frctn Loss (ft)	7.35	Cum Volume (acre-ft)	1.83	0.73	1.15
C & E Loss (ft)	0.10	Cum SA (acres)	1.69	0.21	1.18

CURRENT CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC100yr24hrFP_EXST   UNT Mission Cany   Reach 1 RS: 0.199   Profile: PF 1

E.G. Elev (ft)	1879.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.040	0.030	0.042
W.S. Elev (ft)	1879.13	Reach Len. (ft)	70.10	67.00	73.20
Crit W.S. (ft)		Flow Area (sq ft)	58.45	6.17	79.67
E.G. Slope (ft/ft)	0.013780	Area (sq ft)	58.45	6.17	79.67
Q Total (cfs)	622.00	Flow (cfs)	244.06	45.39	332.54
Top Width (ft)	144.38	Top Width (ft)	62.34	3.00	79.03
Vel Total (ft/s)	4.31	Avg. Vel. (ft/s)	4.18	7.36	4.17
Max Chl Dpth (ft)	2.23	Hydr. Depth (ft)	0.94	2.06	1.01
Conv. Total (cfs)	5298.6	Conv. (cfs)	2079.1	386.7	2832.8
Length Wtd. (ft)	71.66	Wetted Per. (ft)	62.37	4.33	79.07
Min Ch El (ft)	1876.90	Shear (lb/sq ft)	0.81	1.22	0.87
Alpha	1.08	Stream Power (lb/ft s)	3.37	9.01	3.62
Frctn Loss (ft)	1.20	Cum Volume (acre-ft)	1.32	0.67	0.68
C & E Loss (ft)	0.01	Cum SA (acres)	1.23	0.18	0.72

Plan: UNTMC100yr24hrFP_EXST   UNT Mission Cany   Reach 1 RS: 0.186   Profile: PF 1

E.G. Elev (ft)	1878.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.040	0.030	0.042
W.S. Elev (ft)	1877.82	Reach Len. (ft)	86.90	86.50	87.50
Crit W.S. (ft)	1877.82	Flow Area (sq ft)	38.47	6.44	83.01
E.G. Slope (ft/ft)	0.020704	Area (sq ft)	38.47	6.44	83.01
Q Total (cfs)	622.00	Flow (cfs)	167.04	57.76	397.21
Top Width (ft)	146.56	Top Width (ft)	52.51	3.04	91.00
Vel Total (ft/s)	4.86	Avg. Vel. (ft/s)	4.34	8.97	4.79
Max Chl Dpth (ft)	2.32	Hydr. Depth (ft)	0.73	2.12	0.91
Conv. Total (cfs)	4322.8	Conv. (cfs)	1160.9	401.4	2760.5
Length Wtd. (ft)	87.11	Wetted Per. (ft)	52.53	4.56	91.07
Min Ch El (ft)	1875.50	Shear (lb/sq ft)	0.95	1.82	1.18
Alpha	1.15	Stream Power (lb/ft s)	4.11	16.37	5.64
Frctn Loss (ft)	1.44	Cum Volume (acre-ft)	1.24	0.66	0.54
C & E Loss (ft)	0.03	Cum SA (acres)	1.14	0.18	0.58

Plan: UNTMC100yr24hrFP_EXST   UNT Mission Cany   Reach 1 RS: 0.170   Profile: PF 1

E.G. Elev (ft)	1876.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.040	0.030	0.042
W.S. Elev (ft)	1876.38	Reach Len. (ft)	59.00	56.80	59.60
Crit W.S. (ft)	1876.28	Flow Area (sq ft)	104.33	6.57	30.94
E.G. Slope (ft/ft)	0.013448	Area (sq ft)	104.33	6.57	30.94
Q Total (cfs)	622.00	Flow (cfs)	467.54	48.56	105.89
Top Width (ft)	141.85	Top Width (ft)	98.29	3.00	40.56
Vel Total (ft/s)	4.39	Avg. Vel. (ft/s)	4.48	7.39	3.42
Max Chl Dpth (ft)	2.38	Hydr. Depth (ft)	1.06	2.19	0.76
Conv. Total (cfs)	5363.7	Conv. (cfs)	4031.8	418.8	913.1
Length Wtd. (ft)	58.55	Wetted Per. (ft)	98.32	4.51	40.60
Min Ch El (ft)	1874.00	Shear (lb/sq ft)	0.89	1.22	0.64
Alpha	1.11	Stream Power (lb/ft s)	3.99	9.04	2.19
Frctn Loss (ft)	0.74	Cum Volume (acre-ft)	1.09	0.65	0.43
C & E Loss (ft)	0.02	Cum SA (acres)	0.99	0.17	0.44

CURRENT CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC100yr24hrFP_EXST   UNT Mission Cany   Reach 1 RS: 0.159   Profile: PF 1

E.G. Elev (ft)	1875.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.	0.040	0.030	0.042
W.S. Elev (ft)	1875.41	Reach Len. (ft)	68.30	57.50	59.30
Crit W.S. (ft)	1875.41	Flow Area (sq ft)	81.65	30.67	9.86
E.G. Slope (ft/ft)	0.011988	Area (sq ft)	81.65	30.67	9.86
Q Total (cfs)	622.00	Flow (cfs)	353.02	242.59	26.39
Top Width (ft)	108.94	Top Width (ft)	74.47	17.37	17.10
Vel Total (ft/s)	5.09	Avg. Vel. (ft/s)	4.32	7.91	2.67
Max Chl Dpth (ft)	1.93	Hydr. Depth (ft)	1.10	1.77	0.58
Conv. Total (cfs)	5681.0	Conv. (cfs)	3224.3	2215.7	241.0
Length Wtd. (ft)	63.19	Wetted Per. (ft)	74.50	17.42	17.19
Min Ch El (ft)	1873.47	Shear (lb/sq ft)	0.82	1.32	0.43
Alpha	1.36	Stream Power (lb/ft s)	3.55	10.42	1.15
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	0.97	0.62	0.40
C & E Loss (ft)	0.01	Cum SA (acres)	0.87	0.16	0.41

Plan: UNTMC100yr24hrFP_EXST   UNT Mission Cany   Reach 1 RS: 0.147   Profile: PF 1

E.G. Elev (ft)	1874.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.	0.040	0.030	0.042
W.S. Elev (ft)	1874.10	Reach Len. (ft)	257.30	255.40	260.00
Crit W.S. (ft)	1874.10	Flow Area (sq ft)	74.16	23.33	38.43
E.G. Slope (ft/ft)	0.010028	Area (sq ft)	74.16	23.33	38.43
Q Total (cfs)	622.00	Flow (cfs)	274.31	203.07	144.62
Top Width (ft)	118.33	Top Width (ft)	74.77	8.57	34.99
Vel Total (ft/s)	4.58	Avg. Vel. (ft/s)	3.70	8.70	3.76
Max Chl Dpth (ft)	3.22	Hydr. Depth (ft)	0.99	2.72	1.10
Conv. Total (cfs)	6211.2	Conv. (cfs)	2739.3	2027.8	1444.1
Length Wtd. (ft)	256.86	Wetted Per. (ft)	74.80	10.03	35.10
Min Ch El (ft)	1870.88	Shear (lb/sq ft)	0.62	1.46	0.69
Alpha	1.63	Stream Power (lb/ft s)	2.30	12.67	2.58
Frctn Loss (ft)	3.26	Cum Volume (acre-ft)	0.85	0.59	0.37
C & E Loss (ft)	0.10	Cum SA (acres)	0.75	0.14	0.37

Plan: UNTMC100yr24hrFP_EXST   UNT Mission Cany   Reach 1 RS: 0.098   Profile: PF 1

E.G. Elev (ft)	1869.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.57	Wt. n-Val.	0.044	0.030	0.048
W.S. Elev (ft)	1868.00	Reach Len. (ft)	33.80	33.50	33.60
Crit W.S. (ft)	1868.00	Flow Area (sq ft)	45.45	27.56	10.15
E.G. Slope (ft/ft)	0.016601	Area (sq ft)	45.45	27.56	10.15
Q Total (cfs)	622.00	Flow (cfs)	233.81	348.96	39.23
Top Width (ft)	52.83	Top Width (ft)	35.01	7.36	10.46
Vel Total (ft/s)	7.48	Avg. Vel. (ft/s)	5.14	12.66	3.86
Max Chl Dpth (ft)	4.04	Hydr. Depth (ft)	1.30	3.74	0.97
Conv. Total (cfs)	4827.6	Conv. (cfs)	1814.7	2708.4	304.5
Length Wtd. (ft)	33.50	Wetted Per. (ft)	35.35	9.86	10.65
Min Ch El (ft)	1863.96	Shear (lb/sq ft)	1.33	2.90	0.99
Alpha	1.80	Stream Power (lb/ft s)	6.85	36.68	3.82
Frctn Loss (ft)		Cum Volume (acre-ft)	0.49	0.44	0.22
C & E Loss (ft)		Cum SA (acres)	0.43	0.09	0.23

CURRENT CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC100yr24hrFP_EXST   UNT Mission Cany   Reach 1 RS: 0.092   Profile: PF 1

E.G. Elev (ft)	1866.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.89	Wt. n-Val.	0.022	0.030	0.025
W.S. Elev (ft)	1865.59	Reach Len. (ft)	265.60	266.10	279.20
Crit W.S. (ft)	1865.59	Flow Area (sq ft)	49.50	24.01	10.28
E.G. Slope (ft/ft)	0.006893	Area (sq ft)	49.50	24.01	10.28
Q Total (cfs)	622.00	Flow (cfs)	388.61	180.02	53.37
Top Width (ft)	47.95	Top Width (ft)	29.16	9.53	9.26
Vel Total (ft/s)	7.42	Avg. Vel. (ft/s)	7.85	7.50	5.19
Max Chl Dpth (ft)	2.60	Hydr. Depth (ft)	1.70	2.52	1.11
Conv. Total (cfs)	7492.1	Conv. (cfs)	4680.9	2168.3	642.9
Length Wtd. (ft)	267.12	Wetted Per. (ft)	29.88	9.75	9.53
Min Ch El (ft)	1862.99	Shear (lb/sq ft)	0.71	1.06	0.46
Alpha	1.04	Stream Power (lb/ft s)	5.60	7.95	2.41
Frctn Loss (ft)	2.07	Cum Volume (acre-ft)	0.49	0.30	0.22
C & E Loss (ft)	0.20	Cum SA (acres)	0.40	0.09	0.23

Plan: UNTMC100yr24hrFP_EXST   UNT Mission Cany   Reach 1 RS: 0.042   Profile: PF 1

E.G. Elev (ft)	1863.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.	0.042	0.030	0.040
W.S. Elev (ft)	1863.00	Reach Len. (ft)	25.50	22.30	23.00
Crit W.S. (ft)	1862.98	Flow Area (sq ft)	94.70	19.88	24.35
E.G. Slope (ft/ft)	0.008772	Area (sq ft)	94.70	19.88	24.35
Q Total (cfs)	622.00	Flow (cfs)	376.10	173.53	72.37
Top Width (ft)	108.95	Top Width (ft)	72.07	6.11	30.77
Vel Total (ft/s)	4.48	Avg. Vel. (ft/s)	3.97	8.73	2.97
Max Chl Dpth (ft)	3.50	Hydr. Depth (ft)	1.31	3.25	0.79
Conv. Total (cfs)	6641.2	Conv. (cfs)	4015.7	1852.8	772.7
Length Wtd. (ft)	22.30	Wetted Per. (ft)	72.17	7.70	30.85
Min Ch El (ft)	1859.50	Shear (lb/sq ft)	0.72	1.41	0.43
Alpha	1.59	Stream Power (lb/ft s)	2.85	12.34	1.28
Frctn Loss (ft)		Cum Volume (acre-ft)	0.05	0.17	0.11
C & E Loss (ft)		Cum SA (acres)	0.09	0.04	0.10

Plan: UNTMC100yr24hrFP_EXST   UNT Mission Cany   Reach 1 RS: 0.038   Profile: PF 1

E.G. Elev (ft)	1862.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.	0.026	0.030	0.027
W.S. Elev (ft)	1862.44	Reach Len. (ft)	77.00	79.70	82.70
Crit W.S. (ft)	1862.44	Flow Area (sq ft)	60.88	46.78	5.16
E.G. Slope (ft/ft)	0.006931	Area (sq ft)	60.88	46.78	5.16
Q Total (cfs)	622.00	Flow (cfs)	287.43	323.31	11.26
Top Width (ft)	97.55	Top Width (ft)	61.52	20.34	15.68
Vel Total (ft/s)	5.51	Avg. Vel. (ft/s)	4.72	6.91	2.18
Max Chl Dpth (ft)	3.44	Hydr. Depth (ft)	0.99	2.30	0.33
Conv. Total (cfs)	7471.0	Conv. (cfs)	3452.4	3883.4	135.2
Length Wtd. (ft)	80.18	Wetted Per. (ft)	61.60	21.56	15.70
Min Ch El (ft)	1859.00	Shear (lb/sq ft)	0.43	0.94	0.14
Alpha	1.16	Stream Power (lb/ft s)	2.02	6.49	0.31
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)	0.05	0.07	0.11
C & E Loss (ft)	0.12	Cum SA (acres)	0.05	0.03	0.09

CURRENT CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC100yr24hrFP_EXST   UNT Mission Cany   Reach 1 RS: 0.023   Profile: PF 1

E.G. Elev (ft)	1861.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.030	0.035
W.S. Elev (ft)	1861.41	Reach Len. (ft)			
Crit W.S. (ft)	1860.96	Flow Area (sq ft)		31.75	113.14
E.G. Slope (ft/ft)	0.005007	Area (sq ft)		31.75	113.14
Q Total (cfs)	622.00	Flow (cfs)		175.96	446.04
Top Width (ft)	90.47	Top Width (ft)		15.26	75.20
Vel Total (ft/s)	4.29	Avg. Vel. (ft/s)		5.54	3.94
Max Chl Dpth (ft)	2.41	Hydr. Depth (ft)		2.08	1.50
Conv. Total (cfs)	8789.9	Conv. (cfs)		2486.7	6303.2
Length Wtd. (ft)		Wetted Per. (ft)		15.96	75.26
Min Ch El (ft)	1859.00	Shear (lb/sq ft)		0.62	0.47
Alpha	1.08	Stream Power (lb/ft s)		3.45	1.85
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CURRENT CONDITIONS RESULTS AT CULVERTS

Plan: UNTMC100yr24hrFP_EXST   UNT Mission Cany   Reach 1 RS: 0.095   Culv Group: Culvert #1   Profile: PF 1

Q Culv Group (cfs)	105.98	Culv Full Len (ft)	
# Barrels	1	Culv Vel US (ft/s)	9.57
Q Barrel (cfs)	105.98	Culv Vel DS (ft/s)	10.42
E.G. US. (ft)	1869.32	Culv Inv El Up (ft)	1863.96
W.S. US. (ft)	1868.00	Culv Inv El Dn (ft)	1863.63
E.G. DS (ft)	1866.48	Culv Frctn Ls (ft)	0.46
W.S. DS (ft)	1865.59	Culv Exit Loss (ft)	1.67
Delta EG (ft)	2.84	Culv Entr Loss (ft)	0.71
Delta WS (ft)	2.41	Q Weir (cfs)	514.56
E.G. IC (ft)	1869.28	Weir Sta Lft (ft)	13.31
E.G. OC (ft)	1869.32	Weir Sta Rgt (ft)	158.45
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (ft)	1867.18	Weir Max Depth (ft)	1.90
Culv WS Outlet (ft)	1866.46	Weir Avg Depth (ft)	1.18
Culv Nml Depth (ft)	3.30	Weir Flow Area (sq ft)	171.11
Culv Crt Depth (ft)	2.83	Min El Weir Flow (ft)	1867.67

Plan: UNTMC100yr24hrFP_EXST   UNT Mission Cany   Reach 1 RS: 0.040   Culv Group: Culvert #1   Profile: PF 1

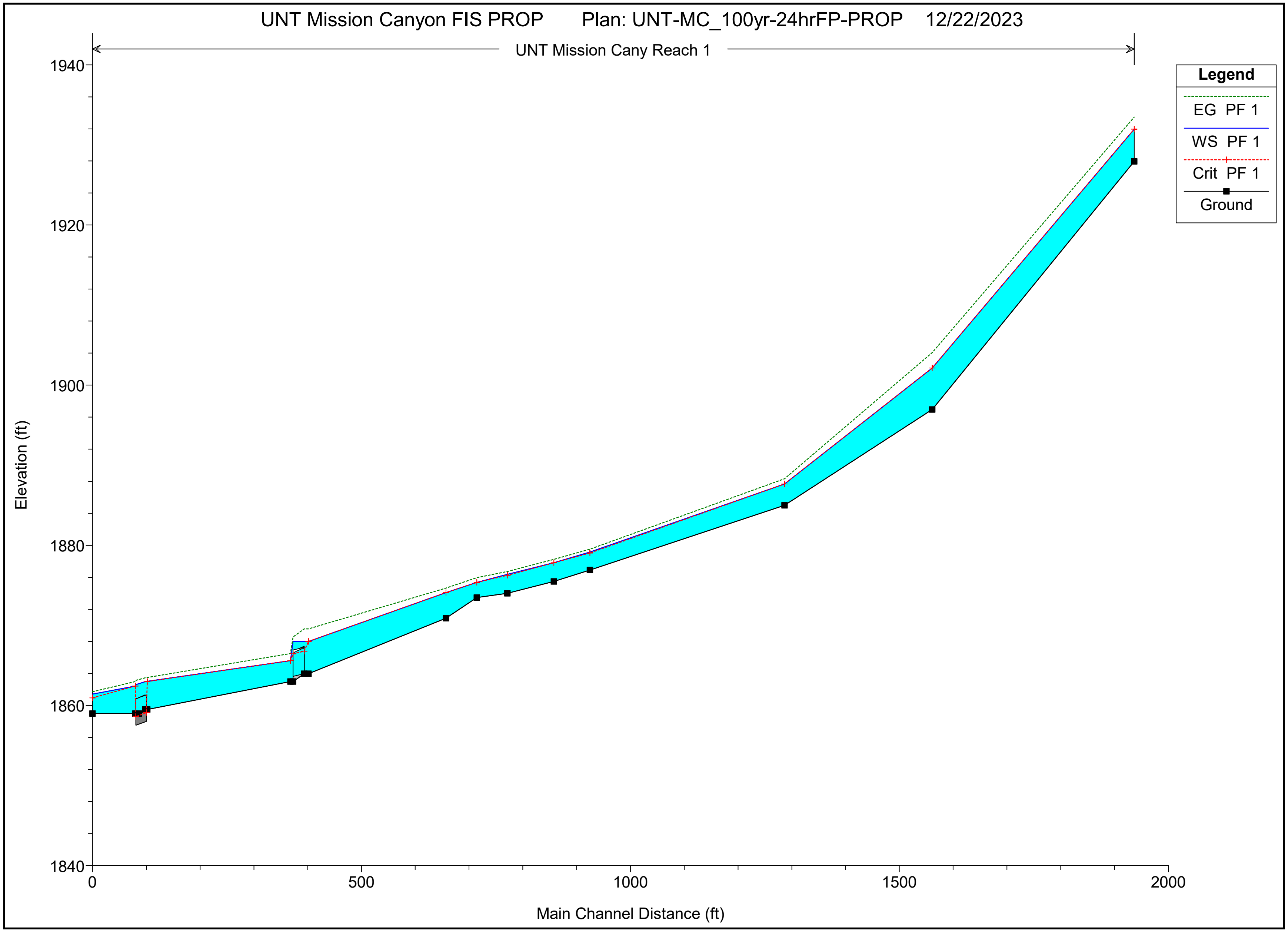
Q Culv Group (cfs)	27.94	Culv Full Len (ft)	19.40
# Barrels	1	Culv Vel US (ft/s)	4.54
Q Barrel (cfs)	27.94	Culv Vel DS (ft/s)	4.54
E.G. US. (ft)	1863.50	Culv Inv El Up (ft)	1858.01
W.S. US. (ft)	1863.00	Culv Inv El Dn (ft)	1857.53
E.G. DS (ft)	1862.98	Culv Frctn Ls (ft)	0.23
W.S. DS (ft)	1862.44	Culv Exit Loss (ft)	0.00
Delta EG (ft)	0.52	Culv Entr Loss (ft)	0.29
Delta WS (ft)	0.57	Q Weir (cfs)	594.06
E.G. IC (ft)	1863.41	Weir Sta Lft (ft)	45.00
E.G. OC (ft)	1863.50	Weir Sta Rgt (ft)	160.89
Culvert Control	Outlet	Weir Submerg	0.40
Culv WS Inlet (ft)	1861.31	Weir Max Depth (ft)	2.13
Culv WS Outlet (ft)	1860.83	Weir Avg Depth (ft)	1.52
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	176.05
Culv Crt Depth (ft)	1.08	Min El Weir Flow (ft)	1861.54

CURRENT CONDITIONS RESULTS TABLE

HEC-RAS Plan: UNTMC100yr24hrFP_EXST River: UNT Mission Cany Reach: Reach 1 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	0.394	PF 1	622.00	1927.94	1931.98	1931.98	1933.49	0.013208	10.50	73.39	26.88	0.93
Reach 1	0.319	PF 1	622.00	1896.97	1902.16	1902.16	1904.08	0.014662	13.02	68.27	19.27	1.03
Reach 1	0.267	PF 1	622.00	1885.00	1887.66	1887.66	1888.31	0.031188	9.62	100.80	77.32	1.07
Reach 1	0.199	PF 1	622.00	1876.90	1879.13		1879.45	0.013780	7.36	144.29	144.38	0.90
Reach 1	0.186	PF 1	622.00	1875.50	1877.82	1877.82	1878.24	0.020704	8.97	127.91	146.56	1.09
Reach 1	0.170	PF 1	622.00	1874.00	1876.38	1876.28	1876.72	0.013448	7.39	141.84	141.85	0.88
Reach 1	0.159	PF 1	622.00	1873.47	1875.41	1875.41	1875.95	0.011988	7.91	122.19	108.94	1.05
Reach 1	0.147	PF 1	622.00	1870.88	1874.10	1874.10	1874.63	0.010028	8.70	135.92	118.33	0.93
Reach 1	0.098	PF 1	622.00	1863.96	1868.00	1868.00	1869.56	0.016601	12.66	83.16	52.83	1.15
Reach 1	0.095		Culvert									
Reach 1	0.092	PF 1	622.00	1862.99	1865.59	1865.59	1866.48	0.006893	7.50	83.78	47.95	0.83
Reach 1	0.042	PF 1	622.00	1859.50	1863.00	1862.98	1863.50	0.008772	8.73	138.94	108.95	0.85
Reach 1	0.040		Culvert									
Reach 1	0.038	PF 1	622.00	1859.00	1862.44	1862.44	1862.98	0.006931	6.91	112.82	97.55	0.80
Reach 1	0.023	PF 1	622.00	1859.00	1861.41	1860.96	1861.72	0.005007	5.54	144.88	90.47	0.68

PROPOSED CONDITIONS PROFILE



MODEL SET 1

PROPOSED CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC-100YR-24HR-PROP UNT Mission Cany Reach 1 RS: 0.394 Profile: PF 1

E.G. Elev (ft)	1933.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.51	Wt. n-Val.	0.056	0.040	0.065
W.S. Elev (ft)	1931.98	Reach Len. (ft)	391.50	375.30	367.30
Crit W.S. (ft)	1931.98	Flow Area (sq ft)	15.22	51.06	7.12
E.G. Slope (ft/ft)	0.013208	Area (sq ft)	15.22	51.06	7.12
Q Total (cfs)	622.00	Flow (cfs)	66.63	536.05	19.32
Top Width (ft)	26.88	Top Width (ft)	8.06	13.02	5.80
Vel Total (ft/s)	8.47	Avg. Vel. (ft/s)	4.38	10.50	2.71
Max Chl Dpth (ft)	4.04	Hydr. Depth (ft)	1.89	3.92	1.23
Conv. Total (cfs)	5412.2	Conv. (cfs)	579.8	4664.4	168.1
Length Wtd. (ft)	378.08	Wetted Per. (ft)	8.84	13.24	6.79
Min Ch El (ft)	1927.94	Shear (lb/sq ft)	1.42	3.18	0.87
Alpha	1.35	Stream Power (lb/ft s)	6.21	33.39	2.35
Frctn Loss (ft)	5.26	Cum Volume (acre-ft)	2.24	1.20	1.33
C & E Loss (ft)	0.04	Cum SA (acres)	1.77	0.32	1.32

Plan: UNTMC-100YR-24HR-PROP UNT Mission Cany Reach 1 RS: 0.319 Profile: PF 1

E.G. Elev (ft)	1904.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.92	Wt. n-Val.	0.056	0.040	0.050
W.S. Elev (ft)	1902.16	Reach Len. (ft)	276.20	274.80	282.60
Crit W.S. (ft)	1902.16	Flow Area (sq ft)	28.43	31.43	8.41
E.G. Slope (ft/ft)	0.014662	Area (sq ft)	28.43	31.43	8.41
Q Total (cfs)	622.00	Flow (cfs)	174.99	409.29	37.72
Top Width (ft)	19.27	Top Width (ft)	9.31	6.27	3.69
Vel Total (ft/s)	9.11	Avg. Vel. (ft/s)	6.16	13.02	4.48
Max Chl Dpth (ft)	5.19	Hydr. Depth (ft)	3.05	5.01	2.28
Conv. Total (cfs)	5136.8	Conv. (cfs)	1445.1	3380.1	311.5
Length Wtd. (ft)	276.53	Wetted Per. (ft)	10.72	6.38	6.05
Min Ch El (ft)	1896.97	Shear (lb/sq ft)	2.43	4.51	1.27
Alpha	1.49	Stream Power (lb/ft s)	14.94	58.71	5.71
Frctn Loss (ft)	5.71	Cum Volume (acre-ft)	2.04	0.85	1.26
C & E Loss (ft)	0.38	Cum SA (acres)	1.69	0.24	1.28

Plan: UNTMC-100YR-24HR-PROP UNT Mission Cany Reach 1 RS: 0.267 Profile: PF 1

E.G. Elev (ft)	1888.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.053	0.040	0.050
W.S. Elev (ft)	1887.66	Reach Len. (ft)	356.90	361.50	389.60
Crit W.S. (ft)	1887.66	Flow Area (sq ft)	68.40	7.48	24.91
E.G. Slope (ft/ft)	0.031188	Area (sq ft)	68.40	7.48	24.91
Q Total (cfs)	622.00	Flow (cfs)	419.02	72.01	130.97
Top Width (ft)	77.32	Top Width (ft)	49.55	3.00	24.77
Vel Total (ft/s)	6.17	Avg. Vel. (ft/s)	6.13	9.62	5.26
Max Chl Dpth (ft)	2.66	Hydr. Depth (ft)	1.38	2.49	1.01
Conv. Total (cfs)	3522.1	Conv. (cfs)	2372.7	407.8	741.6
Length Wtd. (ft)	370.34	Wetted Per. (ft)	49.70	4.21	24.85
Min Ch El (ft)	1885.00	Shear (lb/sq ft)	2.68	3.46	1.95
Alpha	1.10	Stream Power (lb/ft s)	16.42	33.28	10.26
Frctn Loss (ft)	7.86	Cum Volume (acre-ft)	1.73	0.73	1.16
C & E Loss (ft)	0.09	Cum SA (acres)	1.50	0.21	1.18

PROPOSED CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC-100YR-24HR-PROP   UNT Mission Cany   Reach 1 RS: 0.199   Profile: PF 1

E.G. Elev (ft)	1879.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.	0.044	0.030	0.042
W.S. Elev (ft)	1879.15	Reach Len. (ft)	70.10	67.00	73.20
Crit W.S. (ft)	1879.04	Flow Area (sq ft)	47.24	6.23	81.22
E.G. Slope (ft/ft)	0.015366	Area (sq ft)	47.24	6.23	81.22
Q Total (cfs)	622.00	Flow (cfs)	209.97	48.70	363.33
Top Width (ft)	126.96	Top Width (ft)	44.70	3.00	79.26
Vel Total (ft/s)	4.62	Avg. Vel. (ft/s)	4.45	7.82	4.47
Max Chl Dpth (ft)	2.25	Hydr. Depth (ft)	1.06	2.08	1.02
Conv. Total (cfs)	5017.7	Conv. (cfs)	1693.9	392.9	2931.0
Length Wtd. (ft)	71.73	Wetted Per. (ft)	44.81	4.33	79.29
Min Ch El (ft)	1876.90	Shear (lb/sq ft)	1.01	1.38	0.98
Alpha	1.09	Stream Power (lb/ft s)	4.50	10.78	4.40
Frctn Loss (ft)	1.27	Cum Volume (acre-ft)	1.26	0.67	0.68
C & E Loss (ft)	0.01	Cum SA (acres)	1.12	0.18	0.72

Plan: UNTMC-100YR-24HR-PROP   UNT Mission Cany   Reach 1 RS: 0.186   Profile: PF 1

E.G. Elev (ft)	1878.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.040	0.030	0.042
W.S. Elev (ft)	1877.82	Reach Len. (ft)	86.90	86.50	87.50
Crit W.S. (ft)	1877.82	Flow Area (sq ft)	38.46	6.44	82.99
E.G. Slope (ft/ft)	0.020529	Area (sq ft)	38.46	6.44	82.99
Q Total (cfs)	622.00	Flow (cfs)	166.29	57.51	398.21
Top Width (ft)	146.55	Top Width (ft)	52.51	3.04	91.00
Vel Total (ft/s)	4.86	Avg. Vel. (ft/s)	4.32	8.93	4.80
Max Chl Dpth (ft)	2.32	Hydr. Depth (ft)	0.73	2.12	0.91
Conv. Total (cfs)	4341.2	Conv. (cfs)	1160.6	401.4	2779.3
Length Wtd. (ft)	87.11	Wetted Per. (ft)	52.53	4.56	91.07
Min Ch El (ft)	1875.50	Shear (lb/sq ft)	0.94	1.81	1.17
Alpha	1.15	Stream Power (lb/ft s)	4.06	16.16	5.60
Frctn Loss (ft)	1.38	Cum Volume (acre-ft)	1.19	0.66	0.54
C & E Loss (ft)	0.03	Cum SA (acres)	1.04	0.18	0.58

Plan: UNTMC-100YR-24HR-PROP   UNT Mission Cany   Reach 1 RS: 0.170   Profile: PF 1

E.G. Elev (ft)	1876.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.040	0.030	0.039
W.S. Elev (ft)	1876.39	Reach Len. (ft)	59.00	56.80	59.60
Crit W.S. (ft)	1876.26	Flow Area (sq ft)	101.94	6.59	31.09
E.G. Slope (ft/ft)	0.012522	Area (sq ft)	101.94	6.59	31.09
Q Total (cfs)	622.00	Flow (cfs)	462.21	47.00	112.79
Top Width (ft)	133.54	Top Width (ft)	89.93	3.00	40.61
Vel Total (ft/s)	4.45	Avg. Vel. (ft/s)	4.53	7.14	3.63
Max Chl Dpth (ft)	2.39	Hydr. Depth (ft)	1.13	2.20	0.77
Conv. Total (cfs)	5558.5	Conv. (cfs)	4130.6	420.0	1007.9
Length Wtd. (ft)	58.56	Wetted Per. (ft)	90.07	4.51	40.64
Min Ch El (ft)	1874.00	Shear (lb/sq ft)	0.88	1.14	0.60
Alpha	1.08	Stream Power (lb/ft s)	4.01	8.15	2.17
Frctn Loss (ft)	0.74	Cum Volume (acre-ft)	1.05	0.65	0.43
C & E Loss (ft)	0.03	Cum SA (acres)	0.90	0.17	0.44

PROPOSED CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC-100YR-24HR-PROP UNT Mission Cany Reach 1 RS: 0.159 Profile: PF 1

E.G. Elev (ft)	1875.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.	0.040	0.030	0.038
W.S. Elev (ft)	1875.37	Reach Len. (ft)	68.30	57.50	59.30
Crit W.S. (ft)	1875.37	Flow Area (sq ft)	74.11	30.05	9.26
E.G. Slope (ft/ft)	0.012624	Area (sq ft)	74.11	30.05	9.26
Q Total (cfs)	622.00	Flow (cfs)	351.96	240.51	29.53
Top Width (ft)	95.31	Top Width (ft)	61.45	17.37	16.48
Vel Total (ft/s)	5.48	Avg. Vel. (ft/s)	4.75	8.00	3.19
Max Chl Dpth (ft)	1.90	Hydr. Depth (ft)	1.21	1.73	0.56
Conv. Total (cfs)	5536.0	Conv. (cfs)	3132.6	2140.6	262.9
Length Wtd. (ft)	63.13	Wetted Per. (ft)	61.61	17.42	16.57
Min Ch El (ft)	1873.47	Shear (lb/sq ft)	0.95	1.36	0.44
Alpha	1.26	Stream Power (lb/ft s)	4.50	10.88	1.40
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)	0.93	0.62	0.40
C & E Loss (ft)	0.01	Cum SA (acres)	0.80	0.16	0.41

Plan: UNTMC-100YR-24HR-PROP UNT Mission Cany Reach 1 RS: 0.147 Profile: PF 1

E.G. Elev (ft)	1874.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	1874.10	Reach Len. (ft)	257.30	255.40	260.00
Crit W.S. (ft)	1874.10	Flow Area (sq ft)	65.89	23.36	38.57
E.G. Slope (ft/ft)	0.009963	Area (sq ft)	65.89	23.36	38.57
Q Total (cfs)	622.00	Flow (cfs)	265.86	202.93	153.21
Top Width (ft)	101.69	Top Width (ft)	58.06	8.57	35.05
Vel Total (ft/s)	4.87	Avg. Vel. (ft/s)	4.04	8.69	3.97
Max Chl Dpth (ft)	3.22	Hydr. Depth (ft)	1.13	2.73	1.10
Conv. Total (cfs)	6231.4	Conv. (cfs)	2663.5	2033.0	1534.9
Length Wtd. (ft)	256.87	Wetted Per. (ft)	58.19	10.03	35.16
Min Ch El (ft)	1870.88	Shear (lb/sq ft)	0.70	1.45	0.68
Alpha	1.50	Stream Power (lb/ft s)	2.84	12.58	2.71
Frctn Loss (ft)	3.25	Cum Volume (acre-ft)	0.82	0.59	0.37
C & E Loss (ft)	0.10	Cum SA (acres)	0.70	0.14	0.37

Plan: UNTMC-100YR-24HR-PROP UNT Mission Cany Reach 1 RS: 0.098 Profile: PF 1

E.G. Elev (ft)	1869.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.57	Wt. n-Val.	0.044	0.030	0.048
W.S. Elev (ft)	1868.00	Reach Len. (ft)	33.80	33.50	33.60
Crit W.S. (ft)	1868.00	Flow Area (sq ft)	45.45	27.56	10.15
E.G. Slope (ft/ft)	0.016601	Area (sq ft)	45.45	27.56	10.15
Q Total (cfs)	622.00	Flow (cfs)	233.81	348.96	39.23
Top Width (ft)	52.83	Top Width (ft)	35.01	7.36	10.46
Vel Total (ft/s)	7.48	Avg. Vel. (ft/s)	5.14	12.66	3.86
Max Chl Dpth (ft)	4.04	Hydr. Depth (ft)	1.30	3.74	0.97
Conv. Total (cfs)	4827.6	Conv. (cfs)	1814.7	2708.4	304.5
Length Wtd. (ft)	33.50	Wetted Per. (ft)	35.35	9.86	10.65
Min Ch El (ft)	1863.96	Shear (lb/sq ft)	1.33	2.90	0.99
Alpha	1.80	Stream Power (lb/ft s)	6.85	36.68	3.82
Frctn Loss (ft)		Cum Volume (acre-ft)	0.49	0.44	0.22
C & E Loss (ft)		Cum SA (acres)	0.43	0.09	0.23

PROPOSED CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC-100YR-24HR-PROP UNT Mission Cany Reach 1 RS: 0.092 Profile: PF 1

E.G. Elev (ft)	1866.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.89	Wt. n-Val.	0.022	0.030	0.025
W.S. Elev (ft)	1865.59	Reach Len. (ft)	265.60	266.10	279.20
Crit W.S. (ft)	1865.59	Flow Area (sq ft)	49.50	24.01	10.28
E.G. Slope (ft/ft)	0.006893	Area (sq ft)	49.50	24.01	10.28
Q Total (cfs)	622.00	Flow (cfs)	388.61	180.02	53.37
Top Width (ft)	47.95	Top Width (ft)	29.16	9.53	9.26
Vel Total (ft/s)	7.42	Avg. Vel. (ft/s)	7.85	7.50	5.19
Max Chl Dpth (ft)	2.60	Hydr. Depth (ft)	1.70	2.52	1.11
Conv. Total (cfs)	7492.1	Conv. (cfs)	4680.9	2168.3	642.9
Length Wtd. (ft)	267.12	Wetted Per. (ft)	29.88	9.75	9.53
Min Ch El (ft)	1862.99	Shear (lb/sq ft)	0.71	1.06	0.46
Alpha	1.04	Stream Power (lb/ft s)	5.60	7.95	2.41
Frctn Loss (ft)	2.07	Cum Volume (acre-ft)	0.49	0.30	0.22
C & E Loss (ft)	0.20	Cum SA (acres)	0.40	0.09	0.23

Plan: UNTMC-100YR-24HR-PROP UNT Mission Cany Reach 1 RS: 0.042 Profile: PF 1

E.G. Elev (ft)	1863.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.	0.042	0.030	0.040
W.S. Elev (ft)	1863.00	Reach Len. (ft)	25.50	22.30	23.00
Crit W.S. (ft)	1862.98	Flow Area (sq ft)	94.70	19.88	24.35
E.G. Slope (ft/ft)	0.008772	Area (sq ft)	94.70	19.88	24.35
Q Total (cfs)	622.00	Flow (cfs)	376.10	173.53	72.37
Top Width (ft)	108.95	Top Width (ft)	72.07	6.11	30.77
Vel Total (ft/s)	4.48	Avg. Vel. (ft/s)	3.97	8.73	2.97
Max Chl Dpth (ft)	3.50	Hydr. Depth (ft)	1.31	3.25	0.79
Conv. Total (cfs)	6641.2	Conv. (cfs)	4015.7	1852.8	772.7
Length Wtd. (ft)	22.30	Wetted Per. (ft)	72.17	7.70	30.85
Min Ch El (ft)	1859.50	Shear (lb/sq ft)	0.72	1.41	0.43
Alpha	1.59	Stream Power (lb/ft s)	2.85	12.34	1.28
Frctn Loss (ft)		Cum Volume (acre-ft)	0.05	0.17	0.11
C & E Loss (ft)		Cum SA (acres)	0.09	0.04	0.10

Plan: UNTMC-100YR-24HR-PROP UNT Mission Cany Reach 1 RS: 0.038 Profile: PF 1

E.G. Elev (ft)	1862.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.	0.026	0.030	0.027
W.S. Elev (ft)	1862.44	Reach Len. (ft)	77.00	79.70	82.70
Crit W.S. (ft)	1862.44	Flow Area (sq ft)	60.88	46.78	5.16
E.G. Slope (ft/ft)	0.006931	Area (sq ft)	60.88	46.78	5.16
Q Total (cfs)	622.00	Flow (cfs)	287.43	323.31	11.26
Top Width (ft)	97.55	Top Width (ft)	61.52	20.34	15.68
Vel Total (ft/s)	5.51	Avg. Vel. (ft/s)	4.72	6.91	2.18
Max Chl Dpth (ft)	3.44	Hydr. Depth (ft)	0.99	2.30	0.33
Conv. Total (cfs)	7471.0	Conv. (cfs)	3452.4	3883.4	135.2
Length Wtd. (ft)	80.18	Wetted Per. (ft)	61.60	21.56	15.70
Min Ch El (ft)	1859.00	Shear (lb/sq ft)	0.43	0.94	0.14
Alpha	1.16	Stream Power (lb/ft s)	2.02	6.49	0.31
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)	0.05	0.07	0.11
C & E Loss (ft)	0.12	Cum SA (acres)	0.05	0.03	0.09

PROPOSED CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC-100YR-24HR-PROP UNT Mission Cany Reach 1 RS: 0.023 Profile: PF 1

E.G. Elev (ft)	1861.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.030	0.035
W.S. Elev (ft)	1861.41	Reach Len. (ft)			
Crit W.S. (ft)	1860.96	Flow Area (sq ft)		31.75	113.14
E.G. Slope (ft/ft)	0.005007	Area (sq ft)		31.75	113.14
Q Total (cfs)	622.00	Flow (cfs)		175.96	446.04
Top Width (ft)	90.47	Top Width (ft)		15.26	75.20
Vel Total (ft/s)	4.29	Avg. Vel. (ft/s)		5.54	3.94
Max Chl Dpth (ft)	2.41	Hydr. Depth (ft)		2.08	1.50
Conv. Total (cfs)	8789.9	Conv. (cfs)		2486.7	6303.2
Length Wtd. (ft)		Wetted Per. (ft)		15.96	75.26
Min Ch El (ft)	1859.00	Shear (lb/sq ft)		0.62	0.47
Alpha	1.08	Stream Power (lb/ft s)		3.45	1.85
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

PROPOSED CONDITIONS RESULTS AT CULVERTS

Plan: UNTMC-100YR-24HR-PROP   UNT Mission Cany   Reach 1 RS: 0.095   Culv Group: Culvert #1   Profile: PF 1

Q Culv Group (cfs)	105.98	Culv Full Len (ft)	
# Barrels	1	Culv Vel US (ft/s)	9.57
Q Barrel (cfs)	105.98	Culv Vel DS (ft/s)	10.42
E.G. US. (ft)	1869.32	Culv Inv El Up (ft)	1863.96
W.S. US. (ft)	1868.00	Culv Inv El Dn (ft)	1863.63
E.G. DS (ft)	1866.48	Culv Frctn Ls (ft)	0.46
W.S. DS (ft)	1865.59	Culv Exit Loss (ft)	1.67
Delta EG (ft)	2.84	Culv Entr Loss (ft)	0.71
Delta WS (ft)	2.41	Q Weir (cfs)	514.56
E.G. IC (ft)	1869.28	Weir Sta Lft (ft)	13.31
E.G. OC (ft)	1869.32	Weir Sta Rgt (ft)	158.45
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (ft)	1867.18	Weir Max Depth (ft)	1.90
Culv WS Outlet (ft)	1866.46	Weir Avg Depth (ft)	1.18
Culv Nml Depth (ft)	3.30	Weir Flow Area (sq ft)	171.11
Culv Crt Depth (ft)	2.83	Min El Weir Flow (ft)	1867.67

Plan: UNTMC-100YR-24HR-PROP   UNT Mission Cany   Reach 1 RS: 0.040   Culv Group: Culvert #1   Profile: PF 1

Q Culv Group (cfs)	27.94	Culv Full Len (ft)	19.40
# Barrels	1	Culv Vel US (ft/s)	4.54
Q Barrel (cfs)	27.94	Culv Vel DS (ft/s)	4.54
E.G. US. (ft)	1863.50	Culv Inv El Up (ft)	1858.01
W.S. US. (ft)	1863.00	Culv Inv El Dn (ft)	1857.53
E.G. DS (ft)	1862.98	Culv Frctn Ls (ft)	0.23
W.S. DS (ft)	1862.44	Culv Exit Loss (ft)	0.00
Delta EG (ft)	0.52	Culv Entr Loss (ft)	0.29
Delta WS (ft)	0.57	Q Weir (cfs)	594.06
E.G. IC (ft)	1863.41	Weir Sta Lft (ft)	45.00
E.G. OC (ft)	1863.50	Weir Sta Rgt (ft)	160.89
Culvert Control	Outlet	Weir Submerg	0.40
Culv WS Inlet (ft)	1861.31	Weir Max Depth (ft)	2.13
Culv WS Outlet (ft)	1860.83	Weir Avg Depth (ft)	1.52
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	176.05
Culv Crt Depth (ft)	1.08	Min El Weir Flow (ft)	1861.54

PROPOSED CONDITIONS RESULTS TABLE

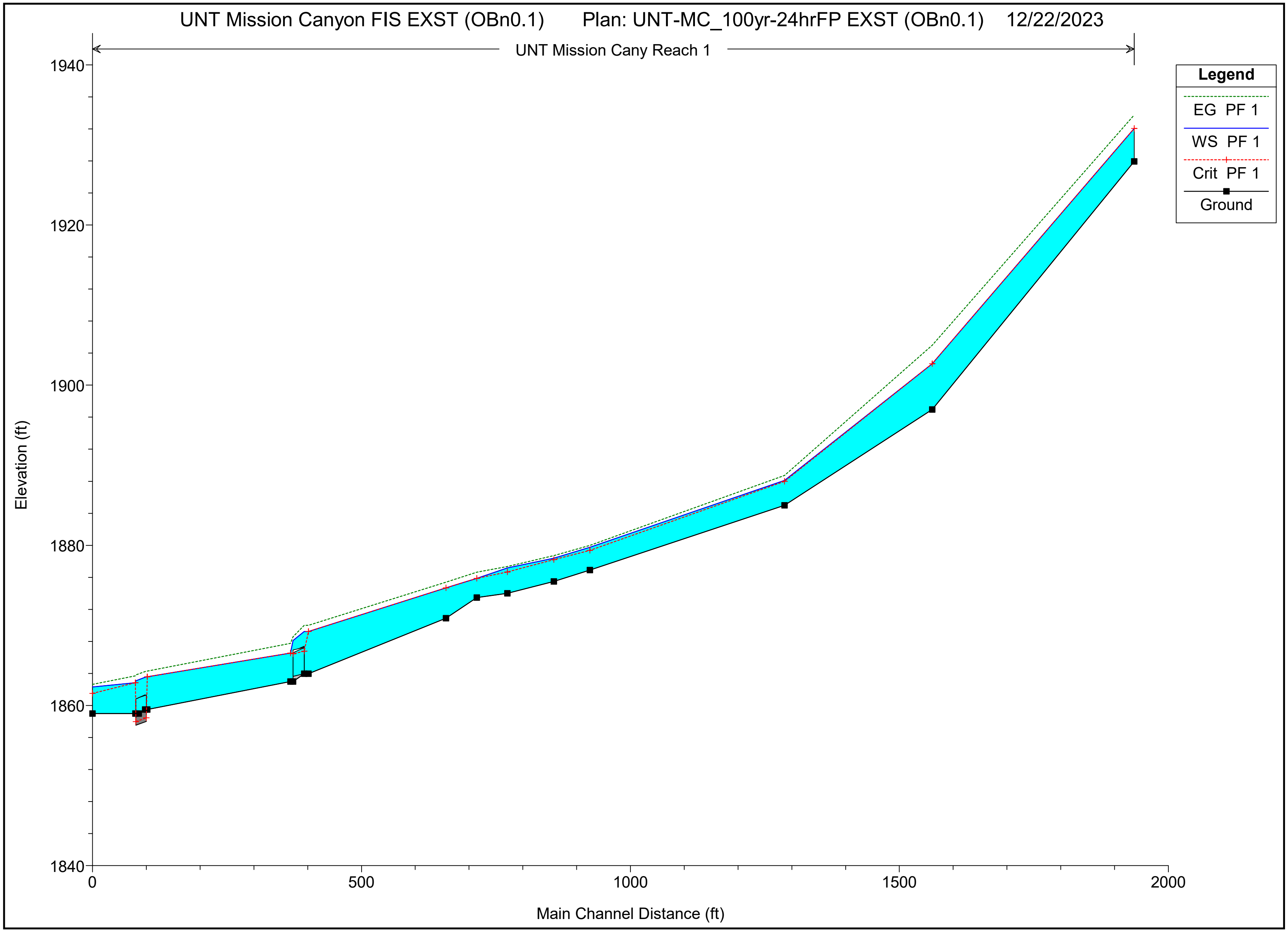
HEC-RAS Plan: UNTMC-100YR-24HR-PROP River: UNT Mission Cany Reach: Reach 1 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	0.394	PF 1	622.00	1927.94	1931.98	1931.98	1933.49	0.013208	10.50	73.39	26.88	0.93
Reach 1	0.319	PF 1	622.00	1896.97	1902.16	1902.16	1904.08	0.014662	13.02	68.27	19.27	1.03
Reach 1	0.267	PF 1	622.00	1885.00	1887.66	1887.66	1888.31	0.031188	9.62	100.80	77.32	1.07
Reach 1	0.199	PF 1	622.00	1876.90	1879.15	1879.04	1879.51	0.015366	7.82	134.69	126.96	0.96
Reach 1	0.186	PF 1	622.00	1875.50	1877.82	1877.82	1878.24	0.020529	8.93	127.89	146.55	1.08
Reach 1	0.170	PF 1	622.00	1874.00	1876.39	1876.26	1876.72	0.012522	7.14	139.62	133.54	0.85
Reach 1	0.159	PF 1	622.00	1873.47	1875.37	1875.37	1875.96	0.012624	8.00	113.41	95.31	1.07
Reach 1	0.147	PF 1	622.00	1870.88	1874.10	1874.10	1874.65	0.009963	8.69	127.82	101.69	0.93
Reach 1	0.098	PF 1	622.00	1863.96	1868.00	1868.00	1869.56	0.016601	12.66	83.16	52.83	1.15
Reach 1	0.095		Culvert									
Reach 1	0.092	PF 1	622.00	1862.99	1865.59	1865.59	1866.48	0.006893	7.50	83.78	47.95	0.83
Reach 1	0.042	PF 1	622.00	1859.50	1863.00	1862.98	1863.50	0.008772	8.73	138.94	108.95	0.85
Reach 1	0.040		Culvert									
Reach 1	0.038	PF 1	622.00	1859.00	1862.44	1862.44	1862.98	0.006931	6.91	112.82	97.55	0.80
Reach 1	0.023	PF 1	622.00	1859.00	1861.41	1860.96	1861.72	0.005007	5.54	144.88	90.47	0.68

Appendix D

Model Set 2 Output Data

CURRENT CONDITIONS PROFILE



MODEL SET 2

CURRENT CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC100yr24hrFP_EXST(OBn0.1) UNT Mission Cany Reach 1 RS: 0.394 Profile: PF 1

E.G. Elev (ft)	1933.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.69	Wt. n-Val.	0.100	0.040	0.100
W.S. Elev (ft)	1932.07	Reach Len. (ft)	391.50	375.30	367.30
Crit W.S. (ft)	1932.07	Flow Area (sq ft)	15.91	52.16	7.62
E.G. Slope (ft/ft)	0.013781	Area (sq ft)	15.91	52.16	7.62
Q Total (cfs)	622.00	Flow (cfs)	40.46	567.42	14.12
Top Width (ft)	27.19	Top Width (ft)	8.23	13.02	5.95
Vel Total (ft/s)	8.22	Avg. Vel. (ft/s)	2.54	10.88	1.85
Max Chl Dpth (ft)	4.13	Hydr. Depth (ft)	1.93	4.01	1.28
Conv. Total (cfs)	5298.4	Conv. (cfs)	344.7	4833.5	120.2
Length Wtd. (ft)	377.14	Wetted Per. (ft)	9.03	13.24	6.96
Min Ch El (ft)	1927.94	Shear (lb/sq ft)	1.52	3.39	0.94
Alpha	1.61	Stream Power (lb/ft s)	3.86	36.87	1.75
Frctn Loss (ft)	5.31	Cum Volume (acre-ft)	3.73	1.42	2.20
C & E Loss (ft)	0.06	Cum SA (acres)	2.35	0.32	1.57

Plan: UNTMC100yr24hrFP_EXST(OBn0.1) UNT Mission Cany Reach 1 RS: 0.319 Profile: PF 1

E.G. Elev (ft)	1904.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.30	Wt. n-Val.	0.100	0.040	0.100
W.S. Elev (ft)	1902.67	Reach Len. (ft)	276.20	274.80	282.60
Crit W.S. (ft)	1902.67	Flow Area (sq ft)	33.43	34.65	10.41
E.G. Slope (ft/ft)	0.014399	Area (sq ft)	33.43	34.65	10.41
Q Total (cfs)	622.00	Flow (cfs)	119.80	477.27	24.93
Top Width (ft)	20.52	Top Width (ft)	10.18	6.27	4.07
Vel Total (ft/s)	7.92	Avg. Vel. (ft/s)	3.58	13.77	2.40
Max Chl Dpth (ft)	5.70	Hydr. Depth (ft)	3.28	5.53	2.56
Conv. Total (cfs)	5183.5	Conv. (cfs)	998.4	3977.3	207.8
Length Wtd. (ft)	276.30	Wetted Per. (ft)	11.73	6.38	6.69
Min Ch El (ft)	1896.97	Shear (lb/sq ft)	2.56	4.88	1.40
Alpha	2.36	Stream Power (lb/ft s)	9.18	67.23	3.35
Frctn Loss (ft)	6.23	Cum Volume (acre-ft)	3.50	1.04	2.12
C & E Loss (ft)	0.51	Cum SA (acres)	2.26	0.24	1.53

Plan: UNTMC100yr24hrFP_EXST(OBn0.1) UNT Mission Cany Reach 1 RS: 0.267 Profile: PF 1

E.G. Elev (ft)	1888.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.	0.100	0.040	0.100
W.S. Elev (ft)	1888.10	Reach Len. (ft)	356.90	361.50	389.60
Crit W.S. (ft)	1887.98	Flow Area (sq ft)	90.75	8.81	37.16
E.G. Slope (ft/ft)	0.040156	Area (sq ft)	90.75	8.81	37.16
Q Total (cfs)	622.00	Flow (cfs)	391.82	107.21	122.98
Top Width (ft)	86.40	Top Width (ft)	51.78	3.00	31.62
Vel Total (ft/s)	4.55	Avg. Vel. (ft/s)	4.32	12.17	3.31
Max Chl Dpth (ft)	3.10	Hydr. Depth (ft)	1.75	2.94	1.18
Conv. Total (cfs)	3103.9	Conv. (cfs)	1955.3	535.0	613.7
Length Wtd. (ft)	369.12	Wetted Per. (ft)	51.97	4.21	31.71
Min Ch El (ft)	1885.00	Shear (lb/sq ft)	4.38	5.24	2.94
Alpha	1.91	Stream Power (lb/ft s)	18.90	63.80	9.72
Frctn Loss (ft)	8.62	Cum Volume (acre-ft)	3.11	0.91	1.97
C & E Loss (ft)	0.11	Cum SA (acres)	2.07	0.21	1.42

CURRENT CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC100yr24hrFP_EXST(OBn0.1) UNT Mission Cany Reach 1 RS: 0.199 Profile: PF 1

E.G. Elev (ft)	1879.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1879.75	Reach Len. (ft)	70.10	67.00	73.20
Crit W.S. (ft)	1879.37	Flow Area (sq ft)	98.35	8.02	130.20
E.G. Slope (ft/ft)	0.015250	Area (sq ft)	98.35	8.02	130.20
Q Total (cfs)	622.00	Flow (cfs)	231.86	73.86	316.28
Top Width (ft)	155.89	Top Width (ft)	67.47	3.00	85.42
Vel Total (ft/s)	2.63	Avg. Vel. (ft/s)	2.36	9.21	2.43
Max Chl Dpth (ft)	2.85	Hydr. Depth (ft)	1.46	2.67	1.52
Conv. Total (cfs)	5036.7	Conv. (cfs)	1877.5	598.1	2561.1
Length Wtd. (ft)	71.41	Wetted Per. (ft)	67.53	4.33	85.49
Min Ch El (ft)	1876.90	Shear (lb/sq ft)	1.39	1.76	1.45
Alpha	2.19	Stream Power (lb/ft s)	3.27	16.22	3.52
Frctn Loss (ft)	1.27	Cum Volume (acre-ft)	2.34	0.84	1.22
C & E Loss (ft)	0.01	Cum SA (acres)	1.58	0.18	0.89

Plan: UNTMC100yr24hrFP_EXST(OBn0.1) UNT Mission Cany Reach 1 RS: 0.186 Profile: PF 1

E.G. Elev (ft)	1878.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1878.38	Reach Len. (ft)	86.90	86.50	87.50
Crit W.S. (ft)	1878.22	Flow Area (sq ft)	70.44	8.13	134.29
E.G. Slope (ft/ft)	0.020907	Area (sq ft)	70.44	8.13	134.29
Q Total (cfs)	622.00	Flow (cfs)	167.69	85.67	368.64
Top Width (ft)	156.22	Top Width (ft)	60.35	3.04	92.82
Vel Total (ft/s)	2.92	Avg. Vel. (ft/s)	2.38	10.53	2.75
Max Chl Dpth (ft)	2.88	Hydr. Depth (ft)	1.17	2.68	1.45
Conv. Total (cfs)	4301.8	Conv. (cfs)	1159.7	592.5	2549.5
Length Wtd. (ft)	87.09	Wetted Per. (ft)	60.40	4.56	92.98
Min Ch El (ft)	1875.50	Shear (lb/sq ft)	1.52	2.33	1.89
Alpha	2.49	Stream Power (lb/ft s)	3.62	24.52	5.17
Frctn Loss (ft)	1.31	Cum Volume (acre-ft)	2.20	0.82	0.99
C & E Loss (ft)	0.04	Cum SA (acres)	1.48	0.18	0.74

Plan: UNTMC100yr24hrFP_EXST(OBn0.1) UNT Mission Cany Reach 1 RS: 0.170 Profile: PF 1

E.G. Elev (ft)	1877.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1877.17	Reach Len. (ft)	59.00	56.80	59.60
Crit W.S. (ft)	1876.66	Flow Area (sq ft)	184.96	8.92	65.70
E.G. Slope (ft/ft)	0.011294	Area (sq ft)	184.96	8.92	65.70
Q Total (cfs)	622.00	Flow (cfs)	419.57	74.03	128.41
Top Width (ft)	158.00	Top Width (ft)	107.37	3.00	47.63
Vel Total (ft/s)	2.40	Avg. Vel. (ft/s)	2.27	8.30	1.95
Max Chl Dpth (ft)	3.17	Hydr. Depth (ft)	1.72	2.97	1.38
Conv. Total (cfs)	5852.8	Conv. (cfs)	3948.0	696.6	1208.2
Length Wtd. (ft)	58.32	Wetted Per. (ft)	107.44	4.51	47.71
Min Ch El (ft)	1874.00	Shear (lb/sq ft)	1.21	1.40	0.97
Alpha	2.17	Stream Power (lb/ft s)	2.75	11.58	1.90
Frctn Loss (ft)	0.66	Cum Volume (acre-ft)	1.95	0.81	0.79
C & E Loss (ft)	0.06	Cum SA (acres)	1.31	0.17	0.60

CURRENT CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC100yr24hrFP_EXST(OBn0.1)   UNT Mission Cany   Reach 1 RS: 0.159   Profile: PF 1

E.G. Elev (ft)	1876.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1875.88	Reach Len. (ft)	68.30	57.50	59.30
Crit W.S. (ft)	1875.88	Flow Area (sq ft)	119.11	38.95	19.96
E.G. Slope (ft/ft)	0.011495	Area (sq ft)	119.11	38.95	19.96
Q Total (cfs)	622.00	Flow (cfs)	241.12	353.74	27.13
Top Width (ft)	125.70	Top Width (ft)	83.11	17.37	25.22
Vel Total (ft/s)	3.49	Avg. Vel. (ft/s)	2.02	9.08	1.36
Max Chl Dpth (ft)	2.41	Hydr. Depth (ft)	1.43	2.24	0.79
Conv. Total (cfs)	5801.4	Conv. (cfs)	2248.9	3299.3	253.1
Length Wtd. (ft)	61.79	Wetted Per. (ft)	83.16	17.42	25.32
Min Ch El (ft)	1873.47	Shear (lb/sq ft)	1.03	1.60	0.57
Alpha	3.98	Stream Power (lb/ft s)	2.08	14.57	0.77
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	1.74	0.78	0.74
C & E Loss (ft)	0.02	Cum SA (acres)	1.18	0.16	0.55

Plan: UNTMC100yr24hrFP_EXST(OBn0.1)   UNT Mission Cany   Reach 1 RS: 0.147   Profile: PF 1

E.G. Elev (ft)	1875.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.69	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1874.70	Reach Len. (ft)	257.30	255.40	260.00
Crit W.S. (ft)	1874.70	Flow Area (sq ft)	121.43	28.47	62.74
E.G. Slope (ft/ft)	0.009677	Area (sq ft)	121.43	28.47	62.74
Q Total (cfs)	622.00	Flow (cfs)	229.17	278.00	114.83
Top Width (ft)	135.93	Top Width (ft)	82.71	8.57	44.65
Vel Total (ft/s)	2.93	Avg. Vel. (ft/s)	1.89	9.76	1.83
Max Chl Dpth (ft)	3.82	Hydr. Depth (ft)	1.47	3.32	1.41
Conv. Total (cfs)	6323.0	Conv. (cfs)	2329.6	2826.0	1167.3
Length Wtd. (ft)	256.70	Wetted Per. (ft)	82.76	10.03	44.78
Min Ch El (ft)	1870.88	Shear (lb/sq ft)	0.89	1.71	0.85
Alpha	5.21	Stream Power (lb/ft s)	1.67	16.74	1.55
Frctn Loss (ft)	1.97	Cum Volume (acre-ft)	1.55	0.73	0.68
C & E Loss (ft)	0.01	Cum SA (acres)	1.05	0.14	0.50

Plan: UNTMC100yr24hrFP_EXST(OBn0.1)   UNT Mission Cany   Reach 1 RS: 0.098   Profile: PF 1

E.G. Elev (ft)	1870.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.77	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1869.24	Reach Len. (ft)	33.80	33.50	33.60
Crit W.S. (ft)	1869.24	Flow Area (sq ft)	156.36	36.74	32.91
E.G. Slope (ft/ft)	0.006223	Area (sq ft)	156.36	36.74	32.91
Q Total (cfs)	622.00	Flow (cfs)	231.70	344.98	45.32
Top Width (ft)	142.59	Top Width (ft)	109.63	7.36	25.60
Vel Total (ft/s)	2.75	Avg. Vel. (ft/s)	1.48	9.39	1.38
Max Chl Dpth (ft)	5.28	Hydr. Depth (ft)	1.43	4.99	1.29
Conv. Total (cfs)	7884.6	Conv. (cfs)	2937.0	4373.0	574.5
Length Wtd. (ft)	33.50	Wetted Per. (ft)	110.01	9.86	25.85
Min Ch El (ft)	1863.96	Shear (lb/sq ft)	0.55	1.45	0.49
Alpha	6.58	Stream Power (lb/ft s)	0.82	13.59	0.68
Frctn Loss (ft)		Cum Volume (acre-ft)	0.73	0.54	0.39
C & E Loss (ft)		Cum SA (acres)	0.48	0.10	0.29

CURRENT CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC100yr24hrFP_EXST(OBn0.1) UNT Mission Cany Reach 1 RS: 0.092 Profile: PF 1

E.G. Elev (ft)	1867.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.23	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1866.53	Reach Len. (ft)	265.60	266.10	279.20
Crit W.S. (ft)	1866.53	Flow Area (sq ft)	78.16	33.00	20.60
E.G. Slope (ft/ft)	0.010209	Area (sq ft)	78.16	33.00	20.60
Q Total (cfs)	622.00	Flow (cfs)	206.75	372.40	42.85
Top Width (ft)	54.03	Top Width (ft)	32.31	9.53	12.18
Vel Total (ft/s)	4.72	Avg. Vel. (ft/s)	2.65	11.28	2.08
Max Chl Dpth (ft)	3.54	Hydr. Depth (ft)	2.42	3.46	1.69
Conv. Total (cfs)	6155.9	Conv. (cfs)	2046.2	3685.7	424.0
Length Wtd. (ft)	267.11	Wetted Per. (ft)	33.42	9.75	12.63
Min Ch El (ft)	1862.99	Shear (lb/sq ft)	1.49	2.16	1.04
Alpha	3.54	Stream Power (lb/ft s)	3.94	24.35	2.16
Frctn Loss (ft)	2.73	Cum Volume (acre-ft)	0.73	0.38	0.39
C & E Loss (ft)	0.25	Cum SA (acres)	0.43	0.09	0.28

Plan: UNTMC100yr24hrFP_EXST(OBn0.1) UNT Mission Cany Reach 1 RS: 0.042 Profile: PF 1

E.G. Elev (ft)	1864.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1863.57	Reach Len. (ft)	25.50	22.30	23.00
Crit W.S. (ft)	1863.57	Flow Area (sq ft)	136.10	23.33	43.28
E.G. Slope (ft/ft)	0.010238	Area (sq ft)	136.10	23.33	43.28
Q Total (cfs)	622.00	Flow (cfs)	304.84	244.73	72.43
Top Width (ft)	117.52	Top Width (ft)	74.68	6.11	36.73
Vel Total (ft/s)	3.07	Avg. Vel. (ft/s)	2.24	10.49	1.67
Max Chl Dpth (ft)	4.07	Hydr. Depth (ft)	1.82	3.82	1.18
Conv. Total (cfs)	6147.4	Conv. (cfs)	3012.8	2418.7	715.9
Length Wtd. (ft)	22.30	Wetted Per. (ft)	74.85	7.70	36.84
Min Ch El (ft)	1859.50	Shear (lb/sq ft)	1.16	1.94	0.75
Alpha	4.89	Stream Power (lb/ft s)	2.60	20.31	1.26
Frctn Loss (ft)		Cum Volume (acre-ft)	0.08	0.21	0.19
C & E Loss (ft)		Cum SA (acres)	0.10	0.04	0.12

Plan: UNTMC100yr24hrFP_EXST(OBn0.1) UNT Mission Cany Reach 1 RS: 0.038 Profile: PF 1

E.G. Elev (ft)	1863.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1862.85	Reach Len. (ft)	77.00	79.70	82.70
Crit W.S. (ft)	1862.85	Flow Area (sq ft)	86.57	55.16	13.25
E.G. Slope (ft/ft)	0.008292	Area (sq ft)	86.57	55.16	13.25
Q Total (cfs)	622.00	Flow (cfs)	144.39	465.39	12.22
Top Width (ft)	107.01	Top Width (ft)	63.12	20.34	23.54
Vel Total (ft/s)	4.01	Avg. Vel. (ft/s)	1.67	8.44	0.92
Max Chl Dpth (ft)	3.85	Hydr. Depth (ft)	1.37	2.71	0.56
Conv. Total (cfs)	6830.5	Conv. (cfs)	1585.6	5110.7	134.2
Length Wtd. (ft)	80.19	Wetted Per. (ft)	63.25	21.56	23.57
Min Ch El (ft)	1859.00	Shear (lb/sq ft)	0.71	1.32	0.29
Alpha	3.35	Stream Power (lb/ft s)	1.18	11.17	0.27
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	0.08	0.09	0.19
C & E Loss (ft)	0.24	Cum SA (acres)	0.06	0.03	0.11

CURRENT CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC100yr24hrFP_EXST(OBn0.1)   UNT Mission Cany   Reach 1 RS: 0.023   Profile: PF 1

E.G. Elev (ft)	1862.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1862.29	Reach Len. (ft)			
Crit W.S. (ft)	1861.52	Flow Area (sq ft)	0.65	46.03	185.73
E.G. Slope (ft/ft)	0.005007	Area (sq ft)	0.65	46.03	185.73
Q Total (cfs)	622.00	Flow (cfs)	0.18	302.51	319.31
Top Width (ft)	110.71	Top Width (ft)	4.87	17.10	88.74
Vel Total (ft/s)	2.68	Avg. Vel. (ft/s)	0.28	6.57	1.72
Max Chl Dpth (ft)	3.29	Hydr. Depth (ft)	0.13	2.69	2.09
Conv. Total (cfs)	8790.0	Conv. (cfs)	2.5	4275.1	4512.4
Length Wtd. (ft)		Wetted Per. (ft)	4.88	17.93	88.83
Min Ch El (ft)	1859.00	Shear (lb/sq ft)	0.04	0.80	0.65
Alpha	3.14	Stream Power (lb/ft s)	0.01	5.28	1.12
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CURRENT CONDITIONS RESULTS AT CULVERTS

Plan: UNTMC100yr24hrFP_EXST(OBn0.1) UNT Mission Cany Reach 1 RS: 0.095 Culv Group: Culvert #1 Profile: PF 1

Q Culv Group (cfs)	105.92	Culv Full Len (ft)	
# Barrels	1	Culv Vel US (ft/s)	9.56
Q Barrel (cfs)	105.92	Culv Vel DS (ft/s)	10.20
E.G. US. (ft)	1869.32	Culv Inv El Up (ft)	1863.96
W.S. US. (ft)	1869.24	Culv Inv El Dn (ft)	1863.63
E.G. DS (ft)	1867.76	Culv Frctn Ls (ft)	0.46
W.S. DS (ft)	1866.53	Culv Exit Loss (ft)	0.39
Delta EG (ft)	1.56	Culv Entr Loss (ft)	0.71
Delta WS (ft)	2.71	Q Weir (cfs)	515.07
E.G. IC (ft)	1869.31	Weir Sta Lft (ft)	13.30
E.G. OC (ft)	1869.32	Weir Sta Rgt (ft)	158.47
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (ft)	1867.19	Weir Max Depth (ft)	1.91
Culv WS Outlet (ft)	1866.53	Weir Avg Depth (ft)	1.18
Culv Nml Depth (ft)	3.30	Weir Flow Area (sq ft)	171.23
Culv Crt Depth (ft)	2.83	Min El Weir Flow (ft)	1867.67

Plan: UNTMC100yr24hrFP_EXST(OBn0.1) UNT Mission Cany Reach 1 RS: 0.040 Culv Group: Culvert #1 Profile: PF 1

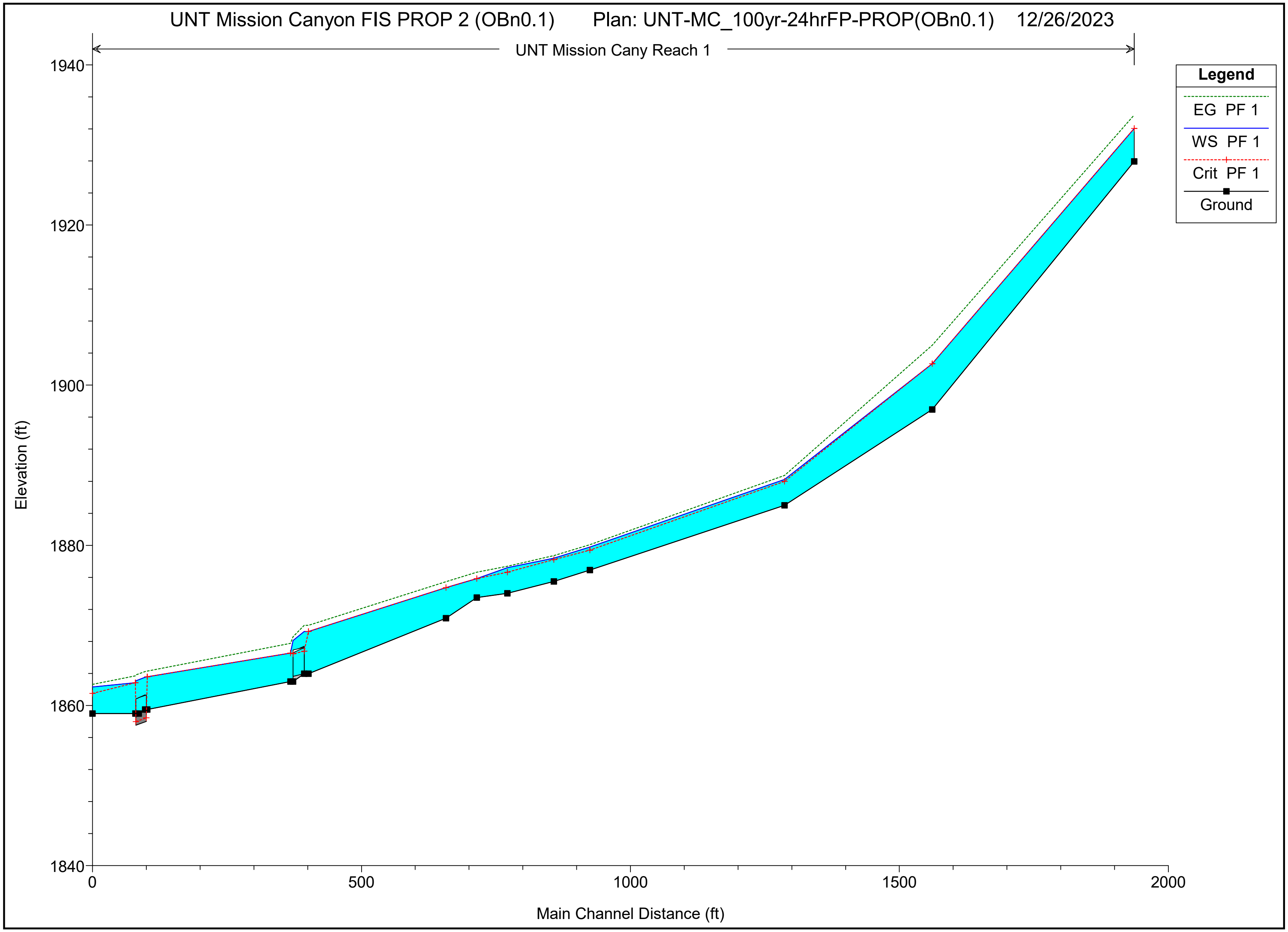
Q Culv Group (cfs)	7.08	Culv Full Len (ft)	19.40
# Barrels	1	Culv Vel US (ft/s)	1.15
Q Barrel (cfs)	7.08	Culv Vel DS (ft/s)	1.15
E.G. US. (ft)	1863.72	Culv Inv El Up (ft)	1858.01
W.S. US. (ft)	1863.57	Culv Inv El Dn (ft)	1857.53
E.G. DS (ft)	1863.69	Culv Frctn Ls (ft)	0.01
W.S. DS (ft)	1862.85	Culv Exit Loss (ft)	0.00
Delta EG (ft)	0.03	Culv Entr Loss (ft)	0.02
Delta WS (ft)	0.72	Q Weir (cfs)	614.92
E.G. IC (ft)	1863.71	Weir Sta Lft (ft)	43.84
E.G. OC (ft)	1863.72	Weir Sta Rgt (ft)	163.04
Culvert Control	Outlet	Weir Submerg	0.89
Culv WS Inlet (ft)	1861.31	Weir Max Depth (ft)	2.38
Culv WS Outlet (ft)	1860.83	Weir Avg Depth (ft)	1.72
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	205.51
Culv Crt Depth (ft)	0.44	Min El Weir Flow (ft)	1861.54

CURRENT CONDITIONS RESULTS TABLE

HEC-RAS Plan: UNTMC100yr24hrFP_EXST(OBn0.1) River: UNT Mission Cany Reach: Reach 1 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	0.394	PF 1	622.00	1927.94	1932.07	1932.07	1933.75	0.013781	10.88	75.68	27.19	0.96
Reach 1	0.319	PF 1	622.00	1896.97	1902.67	1902.67	1904.98	0.014399	13.77	78.50	20.52	1.03
Reach 1	0.267	PF 1	622.00	1885.00	1888.10	1887.98	1888.71	0.040156	12.17	136.71	86.40	1.25
Reach 1	0.199	PF 1	622.00	1876.90	1879.75	1879.37	1879.98	0.015250	9.21	236.57	155.89	0.99
Reach 1	0.186	PF 1	622.00	1875.50	1878.38	1878.22	1878.71	0.020907	10.53	212.86	156.22	1.14
Reach 1	0.170	PF 1	622.00	1874.00	1877.17	1876.66	1877.36	0.011294	8.30	259.58	158.00	0.85
Reach 1	0.159	PF 1	622.00	1873.47	1875.88	1875.88	1876.64	0.011495	9.08	178.02	125.70	1.07
Reach 1	0.147	PF 1	622.00	1870.88	1874.70	1874.70	1875.39	0.009677	9.76	212.64	135.93	0.94
Reach 1	0.098	PF 1	622.00	1863.96	1869.24	1869.24	1870.02	0.006223	9.39	226.01	142.59	0.74
Reach 1	0.095		Culvert									
Reach 1	0.092	PF 1	622.00	1862.99	1866.53	1866.53	1867.76	0.010209	11.28	131.76	54.03	1.07
Reach 1	0.042	PF 1	622.00	1859.50	1863.57	1863.57	1864.28	0.010238	10.49	202.71	117.52	0.95
Reach 1	0.040		Culvert									
Reach 1	0.038	PF 1	622.00	1859.00	1862.85	1862.85	1863.69	0.008292	8.44	154.98	107.01	0.90
Reach 1	0.023	PF 1	622.00	1859.00	1862.29	1861.52	1862.64	0.005007	6.57	232.41	110.71	0.71

PROPOSED CONDITIONS PROFILE



MODEL SET 2

PROPOSED CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC-100YR-24HR-PROP(OBn0.1) UNT Mission Cany Reach 1 RS: 0.394 Profile: PF 1

E.G. Elev (ft)	1933.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.69	Wt. n-Val.	0.100	0.040	0.100
W.S. Elev (ft)	1932.07	Reach Len. (ft)	391.50	375.30	367.30
Crit W.S. (ft)	1932.07	Flow Area (sq ft)	15.91	52.16	7.62
E.G. Slope (ft/ft)	0.013781	Area (sq ft)	15.91	52.16	7.62
Q Total (cfs)	622.00	Flow (cfs)	40.46	567.42	14.12
Top Width (ft)	27.19	Top Width (ft)	8.23	13.02	5.95
Vel Total (ft/s)	8.22	Avg. Vel. (ft/s)	2.54	10.88	1.85
Max Chl Dpth (ft)	4.13	Hydr. Depth (ft)	1.93	4.01	1.28
Conv. Total (cfs)	5298.4	Conv. (cfs)	344.7	4833.5	120.2
Length Wtd. (ft)	377.14	Wetted Per. (ft)	9.03	13.24	6.96
Min Ch El (ft)	1927.94	Shear (lb/sq ft)	1.52	3.39	0.94
Alpha	1.61	Stream Power (lb/ft s)	3.86	36.87	1.75
Frctn Loss (ft)	5.31	Cum Volume (acre-ft)	3.56	1.42	2.24
C & E Loss (ft)	0.06	Cum SA (acres)	2.16	0.32	1.59

Plan: UNTMC-100YR-24HR-PROP(OBn0.1) UNT Mission Cany Reach 1 RS: 0.319 Profile: PF 1

E.G. Elev (ft)	1904.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.30	Wt. n-Val.	0.100	0.040	0.100
W.S. Elev (ft)	1902.67	Reach Len. (ft)	276.20	274.80	282.60
Crit W.S. (ft)	1902.67	Flow Area (sq ft)	33.43	34.65	10.41
E.G. Slope (ft/ft)	0.014399	Area (sq ft)	33.43	34.65	10.41
Q Total (cfs)	622.00	Flow (cfs)	119.80	477.27	24.93
Top Width (ft)	20.52	Top Width (ft)	10.18	6.27	4.07
Vel Total (ft/s)	7.92	Avg. Vel. (ft/s)	3.58	13.77	2.40
Max Chl Dpth (ft)	5.70	Hydr. Depth (ft)	3.28	5.53	2.56
Conv. Total (cfs)	5183.5	Conv. (cfs)	998.4	3977.3	207.8
Length Wtd. (ft)	276.33	Wetted Per. (ft)	11.73	6.38	6.69
Min Ch El (ft)	1896.97	Shear (lb/sq ft)	2.56	4.88	1.40
Alpha	2.36	Stream Power (lb/ft s)	9.18	67.23	3.35
Frctn Loss (ft)	5.75	Cum Volume (acre-ft)	3.34	1.05	2.17
C & E Loss (ft)	0.54	Cum SA (acres)	2.07	0.24	1.54

Plan: UNTMC-100YR-24HR-PROP(OBn0.1) UNT Mission Cany Reach 1 RS: 0.267 Profile: PF 1

E.G. Elev (ft)	1888.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.52	Wt. n-Val.	0.100	0.040	0.100
W.S. Elev (ft)	1888.22	Reach Len. (ft)	356.90	361.50	389.60
Crit W.S. (ft)	1887.98	Flow Area (sq ft)	96.97	9.17	41.03
E.G. Slope (ft/ft)	0.032690	Area (sq ft)	96.97	9.17	41.03
Q Total (cfs)	622.00	Flow (cfs)	391.35	103.37	127.28
Top Width (ft)	88.43	Top Width (ft)	52.47	3.00	32.96
Vel Total (ft/s)	4.23	Avg. Vel. (ft/s)	4.04	11.28	3.10
Max Chl Dpth (ft)	3.22	Hydr. Depth (ft)	1.85	3.06	1.24
Conv. Total (cfs)	3440.2	Conv. (cfs)	2164.5	571.7	704.0
Length Wtd. (ft)	370.09	Wetted Per. (ft)	52.67	4.21	33.07
Min Ch El (ft)	1885.00	Shear (lb/sq ft)	3.76	4.44	2.53
Alpha	1.87	Stream Power (lb/ft s)	15.16	50.08	7.86
Frctn Loss (ft)	8.60	Cum Volume (acre-ft)	2.92	0.91	2.00
C & E Loss (ft)	0.07	Cum SA (acres)	1.88	0.21	1.42

PROPOSED CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC-100YR-24HR-PROP(OBn0.1) UNT Mission Cany Reach 1 RS: 0.199 Profile: PF 1

E.G. Elev (ft)	1880.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1879.78	Reach Len. (ft)	70.10	67.00	73.20
Crit W.S. (ft)	1879.41	Flow Area (sq ft)	78.00	8.11	132.97
E.G. Slope (ft/ft)	0.017363	Area (sq ft)	78.00	8.11	132.97
Q Total (cfs)	622.00	Flow (cfs)	193.07	80.41	348.52
Top Width (ft)	144.79	Top Width (ft)	56.01	3.00	85.79
Vel Total (ft/s)	2.84	Avg. Vel. (ft/s)	2.48	9.91	2.62
Max Chl Dpth (ft)	2.88	Hydr. Depth (ft)	1.39	2.70	1.55
Conv. Total (cfs)	4720.4	Conv. (cfs)	1465.2	610.2	2645.0
Length Wtd. (ft)	71.47	Wetted Per. (ft)	56.15	4.33	85.85
Min Ch El (ft)	1876.90	Shear (lb/sq ft)	1.51	2.03	1.68
Alpha	2.29	Stream Power (lb/ft s)	3.73	20.11	4.40
Frctn Loss (ft)	1.35	Cum Volume (acre-ft)	2.21	0.84	1.22
C & E Loss (ft)	0.00	Cum SA (acres)	1.43	0.18	0.89

Plan: UNTMC-100YR-24HR-PROP(OBn0.1) UNT Mission Cany Reach 1 RS: 0.186 Profile: PF 1

E.G. Elev (ft)	1878.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1878.38	Reach Len. (ft)	86.90	86.50	87.50
Crit W.S. (ft)	1878.22	Flow Area (sq ft)	70.63	8.14	134.58
E.G. Slope (ft/ft)	0.020759	Area (sq ft)	70.63	8.14	134.58
Q Total (cfs)	622.00	Flow (cfs)	167.81	85.54	368.66
Top Width (ft)	156.25	Top Width (ft)	60.38	3.04	92.83
Vel Total (ft/s)	2.92	Avg. Vel. (ft/s)	2.38	10.50	2.74
Max Chl Dpth (ft)	2.88	Hydr. Depth (ft)	1.17	2.68	1.45
Conv. Total (cfs)	4317.1	Conv. (cfs)	1164.7	593.7	2558.7
Length Wtd. (ft)	87.09	Wetted Per. (ft)	60.42	4.56	92.99
Min Ch El (ft)	1875.50	Shear (lb/sq ft)	1.52	2.31	1.88
Alpha	2.49	Stream Power (lb/ft s)	3.60	24.30	5.14
Frctn Loss (ft)	1.28	Cum Volume (acre-ft)	2.09	0.82	1.00
C & E Loss (ft)	0.04	Cum SA (acres)	1.34	0.18	0.74

Plan: UNTMC-100YR-24HR-PROP(OBn0.1) UNT Mission Cany Reach 1 RS: 0.170 Profile: PF 1

E.G. Elev (ft)	1877.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1877.19	Reach Len. (ft)	59.00	56.80	59.60
Crit W.S. (ft)	1876.65	Flow Area (sq ft)	174.70	8.99	66.85
E.G. Slope (ft/ft)	0.010982	Area (sq ft)	174.70	8.99	66.85
Q Total (cfs)	622.00	Flow (cfs)	417.93	73.99	130.08
Top Width (ft)	142.17	Top Width (ft)	91.40	3.00	47.77
Vel Total (ft/s)	2.48	Avg. Vel. (ft/s)	2.39	8.23	1.95
Max Chl Dpth (ft)	3.19	Hydr. Depth (ft)	1.91	3.00	1.40
Conv. Total (cfs)	5935.3	Conv. (cfs)	3988.0	706.1	1241.3
Length Wtd. (ft)	58.31	Wetted Per. (ft)	91.75	4.51	47.85
Min Ch El (ft)	1874.00	Shear (lb/sq ft)	1.31	1.37	0.96
Alpha	2.06	Stream Power (lb/ft s)	3.12	11.25	1.86
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	1.84	0.81	0.80
C & E Loss (ft)	0.06	Cum SA (acres)	1.19	0.17	0.60

PROPOSED CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC-100YR-24HR-PROP(OBn0.1)   UNT Mission Cany   Reach 1 RS: 0.159   Profile: PF 1

E.G. Elev (ft)	1876.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.80	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1875.85	Reach Len. (ft)	68.30	57.50	59.30
Crit W.S. (ft)	1875.85	Flow Area (sq ft)	103.72	38.36	19.11
E.G. Slope (ft/ft)	0.012275	Area (sq ft)	103.72	38.36	19.11
Q Total (cfs)	622.00	Flow (cfs)	239.18	356.33	26.49
Top Width (ft)	104.29	Top Width (ft)	62.28	17.37	24.64
Vel Total (ft/s)	3.86	Avg. Vel. (ft/s)	2.31	9.29	1.39
Max Chl Dpth (ft)	2.38	Hydr. Depth (ft)	1.67	2.21	0.78
Conv. Total (cfs)	5614.1	Conv. (cfs)	2158.8	3216.3	239.1
Length Wtd. (ft)	61.66	Wetted Per. (ft)	62.56	17.42	24.74
Min Ch El (ft)	1873.47	Shear (lb/sq ft)	1.27	1.69	0.59
Alpha	3.46	Stream Power (lb/ft s)	2.93	15.68	0.82
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	1.65	0.78	0.74
C & E Loss (ft)	0.01	Cum SA (acres)	1.08	0.16	0.55

Plan: UNTMC-100YR-24HR-PROP(OBn0.1)   UNT Mission Cany   Reach 1 RS: 0.147   Profile: PF 1

E.G. Elev (ft)	1875.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.76	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1874.71	Reach Len. (ft)	257.30	255.40	260.00
Crit W.S. (ft)	1874.71	Flow Area (sq ft)	102.01	28.55	63.17
E.G. Slope (ft/ft)	0.010223	Area (sq ft)	102.01	28.55	63.17
Q Total (cfs)	622.00	Flow (cfs)	215.76	287.10	119.14
Top Width (ft)	114.21	Top Width (ft)	60.86	8.57	44.78
Vel Total (ft/s)	3.21	Avg. Vel. (ft/s)	2.12	10.06	1.89
Max Chl Dpth (ft)	3.83	Hydr. Depth (ft)	1.68	3.33	1.41
Conv. Total (cfs)	6151.8	Conv. (cfs)	2134.0	2839.6	1178.3
Length Wtd. (ft)	256.69	Wetted Per. (ft)	61.06	10.03	44.91
Min Ch El (ft)	1870.88	Shear (lb/sq ft)	1.07	1.82	0.90
Alpha	4.74	Stream Power (lb/ft s)	2.26	18.26	1.69
Frctn Loss (ft)	2.02	Cum Volume (acre-ft)	1.49	0.73	0.68
C & E Loss (ft)	0.00	Cum SA (acres)	0.99	0.14	0.50

Plan: UNTMC-100YR-24HR-PROP(OBn0.1)   UNT Mission Cany   Reach 1 RS: 0.098   Profile: PF 1

E.G. Elev (ft)	1870.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.77	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1869.24	Reach Len. (ft)	33.80	33.50	33.60
Crit W.S. (ft)	1869.24	Flow Area (sq ft)	156.36	36.74	32.91
E.G. Slope (ft/ft)	0.006223	Area (sq ft)	156.36	36.74	32.91
Q Total (cfs)	622.00	Flow (cfs)	231.70	344.98	45.32
Top Width (ft)	142.59	Top Width (ft)	109.63	7.36	25.60
Vel Total (ft/s)	2.75	Avg. Vel. (ft/s)	1.48	9.39	1.38
Max Chl Dpth (ft)	5.28	Hydr. Depth (ft)	1.43	4.99	1.29
Conv. Total (cfs)	7884.6	Conv. (cfs)	2937.0	4373.0	574.5
Length Wtd. (ft)	33.50	Wetted Per. (ft)	110.01	9.86	25.85
Min Ch El (ft)	1863.96	Shear (lb/sq ft)	0.55	1.45	0.49
Alpha	6.58	Stream Power (lb/ft s)	0.82	13.59	0.68
Frctn Loss (ft)		Cum Volume (acre-ft)	0.73	0.54	0.39
C & E Loss (ft)		Cum SA (acres)	0.48	0.10	0.29

PROPOSED CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC-100YR-24HR-PROP(OBn0.1) UNT Mission Cany Reach 1 RS: 0.092 Profile: PF 1

E.G. Elev (ft)	1867.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.23	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1866.53	Reach Len. (ft)	265.60	266.10	279.20
Crit W.S. (ft)	1866.53	Flow Area (sq ft)	78.16	33.00	20.60
E.G. Slope (ft/ft)	0.010209	Area (sq ft)	78.16	33.00	20.60
Q Total (cfs)	622.00	Flow (cfs)	206.75	372.40	42.85
Top Width (ft)	54.03	Top Width (ft)	32.31	9.53	12.18
Vel Total (ft/s)	4.72	Avg. Vel. (ft/s)	2.65	11.28	2.08
Max Chl Dpth (ft)	3.54	Hydr. Depth (ft)	2.42	3.46	1.69
Conv. Total (cfs)	6155.9	Conv. (cfs)	2046.2	3685.7	424.0
Length Wtd. (ft)	267.11	Wetted Per. (ft)	33.42	9.75	12.63
Min Ch El (ft)	1862.99	Shear (lb/sq ft)	1.49	2.16	1.04
Alpha	3.54	Stream Power (lb/ft s)	3.94	24.35	2.16
Frctn Loss (ft)	2.73	Cum Volume (acre-ft)	0.73	0.38	0.39
C & E Loss (ft)	0.25	Cum SA (acres)	0.43	0.09	0.28

Plan: UNTMC-100YR-24HR-PROP(OBn0.1) UNT Mission Cany Reach 1 RS: 0.042 Profile: PF 1

E.G. Elev (ft)	1864.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1863.57	Reach Len. (ft)	25.50	22.30	23.00
Crit W.S. (ft)	1863.57	Flow Area (sq ft)	136.10	23.33	43.28
E.G. Slope (ft/ft)	0.010238	Area (sq ft)	136.10	23.33	43.28
Q Total (cfs)	622.00	Flow (cfs)	304.84	244.73	72.43
Top Width (ft)	117.52	Top Width (ft)	74.68	6.11	36.73
Vel Total (ft/s)	3.07	Avg. Vel. (ft/s)	2.24	10.49	1.67
Max Chl Dpth (ft)	4.07	Hydr. Depth (ft)	1.82	3.82	1.18
Conv. Total (cfs)	6147.4	Conv. (cfs)	3012.8	2418.7	715.9
Length Wtd. (ft)	22.30	Wetted Per. (ft)	74.85	7.70	36.84
Min Ch El (ft)	1859.50	Shear (lb/sq ft)	1.16	1.94	0.75
Alpha	4.89	Stream Power (lb/ft s)	2.60	20.31	1.26
Frctn Loss (ft)		Cum Volume (acre-ft)	0.08	0.21	0.19
C & E Loss (ft)		Cum SA (acres)	0.10	0.04	0.12

Plan: UNTMC-100YR-24HR-PROP(OBn0.1) UNT Mission Cany Reach 1 RS: 0.038 Profile: PF 1

E.G. Elev (ft)	1863.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1862.85	Reach Len. (ft)	77.00	79.70	82.70
Crit W.S. (ft)	1862.85	Flow Area (sq ft)	86.57	55.16	13.25
E.G. Slope (ft/ft)	0.008292	Area (sq ft)	86.57	55.16	13.25
Q Total (cfs)	622.00	Flow (cfs)	144.39	465.39	12.22
Top Width (ft)	107.01	Top Width (ft)	63.12	20.34	23.54
Vel Total (ft/s)	4.01	Avg. Vel. (ft/s)	1.67	8.44	0.92
Max Chl Dpth (ft)	3.85	Hydr. Depth (ft)	1.37	2.71	0.56
Conv. Total (cfs)	6830.5	Conv. (cfs)	1585.6	5110.7	134.2
Length Wtd. (ft)	80.19	Wetted Per. (ft)	63.25	21.56	23.57
Min Ch El (ft)	1859.00	Shear (lb/sq ft)	0.71	1.32	0.29
Alpha	3.35	Stream Power (lb/ft s)	1.18	11.17	0.27
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	0.08	0.09	0.19
C & E Loss (ft)	0.24	Cum SA (acres)	0.06	0.03	0.11

PROPOSED CONDITIONS RESULTS BY CROSS-SECTION

Plan: UNTMC-100YR-24HR-PROP(OBn0.1)   UNT Mission Cany   Reach 1 RS: 0.023   Profile: PF 1

E.G. Elev (ft)	1862.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	1862.29	Reach Len. (ft)			
Crit W.S. (ft)	1861.52	Flow Area (sq ft)	0.65	46.03	185.73
E.G. Slope (ft/ft)	0.005007	Area (sq ft)	0.65	46.03	185.73
Q Total (cfs)	622.00	Flow (cfs)	0.18	302.51	319.31
Top Width (ft)	110.71	Top Width (ft)	4.87	17.10	88.74
Vel Total (ft/s)	2.68	Avg. Vel. (ft/s)	0.28	6.57	1.72
Max Chl Dpth (ft)	3.29	Hydr. Depth (ft)	0.13	2.69	2.09
Conv. Total (cfs)	8790.0	Conv. (cfs)	2.5	4275.1	4512.4
Length Wtd. (ft)		Wetted Per. (ft)	4.88	17.93	88.83
Min Ch El (ft)	1859.00	Shear (lb/sq ft)	0.04	0.80	0.65
Alpha	3.14	Stream Power (lb/ft s)	0.01	5.28	1.12
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

PROPOSED CONDITIONS RESULTS AT CULVERTS

Plan: UNTMC-100YR-24HR-PROP(OBn0.1) UNT Mission Cany Reach 1 RS: 0.095 Culv Group: Culvert #1 Profile: PF 1

Q Culv Group (cfs)	105.92	Culv Full Len (ft)	
# Barrels	1	Culv Vel US (ft/s)	9.56
Q Barrel (cfs)	105.92	Culv Vel DS (ft/s)	10.20
E.G. US. (ft)	1869.32	Culv Inv El Up (ft)	1863.96
W.S. US. (ft)	1869.24	Culv Inv El Dn (ft)	1863.63
E.G. DS (ft)	1867.76	Culv Frctn Ls (ft)	0.46
W.S. DS (ft)	1866.53	Culv Exit Loss (ft)	0.39
Delta EG (ft)	1.56	Culv Entr Loss (ft)	0.71
Delta WS (ft)	2.71	Q Weir (cfs)	515.07
E.G. IC (ft)	1869.31	Weir Sta Lft (ft)	13.30
E.G. OC (ft)	1869.32	Weir Sta Rgt (ft)	158.47
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (ft)	1867.19	Weir Max Depth (ft)	1.91
Culv WS Outlet (ft)	1866.53	Weir Avg Depth (ft)	1.18
Culv Nml Depth (ft)	3.30	Weir Flow Area (sq ft)	171.23
Culv Crt Depth (ft)	2.83	Min El Weir Flow (ft)	1867.67

Plan: UNTMC-100YR-24HR-PROP(OBn0.1) UNT Mission Cany Reach 1 RS: 0.040 Culv Group: Culvert #1 Profile: PF 1

Q Culv Group (cfs)	7.08	Culv Full Len (ft)	19.40
# Barrels	1	Culv Vel US (ft/s)	1.15
Q Barrel (cfs)	7.08	Culv Vel DS (ft/s)	1.15
E.G. US. (ft)	1863.72	Culv Inv El Up (ft)	1858.01
W.S. US. (ft)	1863.57	Culv Inv El Dn (ft)	1857.53
E.G. DS (ft)	1863.69	Culv Frctn Ls (ft)	0.01
W.S. DS (ft)	1862.85	Culv Exit Loss (ft)	0.00
Delta EG (ft)	0.03	Culv Entr Loss (ft)	0.02
Delta WS (ft)	0.72	Q Weir (cfs)	614.92
E.G. IC (ft)	1863.71	Weir Sta Lft (ft)	43.84
E.G. OC (ft)	1863.72	Weir Sta Rgt (ft)	163.04
Culvert Control	Outlet	Weir Submerg	0.89
Culv WS Inlet (ft)	1861.31	Weir Max Depth (ft)	2.38
Culv WS Outlet (ft)	1860.83	Weir Avg Depth (ft)	1.72
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	205.51
Culv Crt Depth (ft)	0.44	Min El Weir Flow (ft)	1861.54

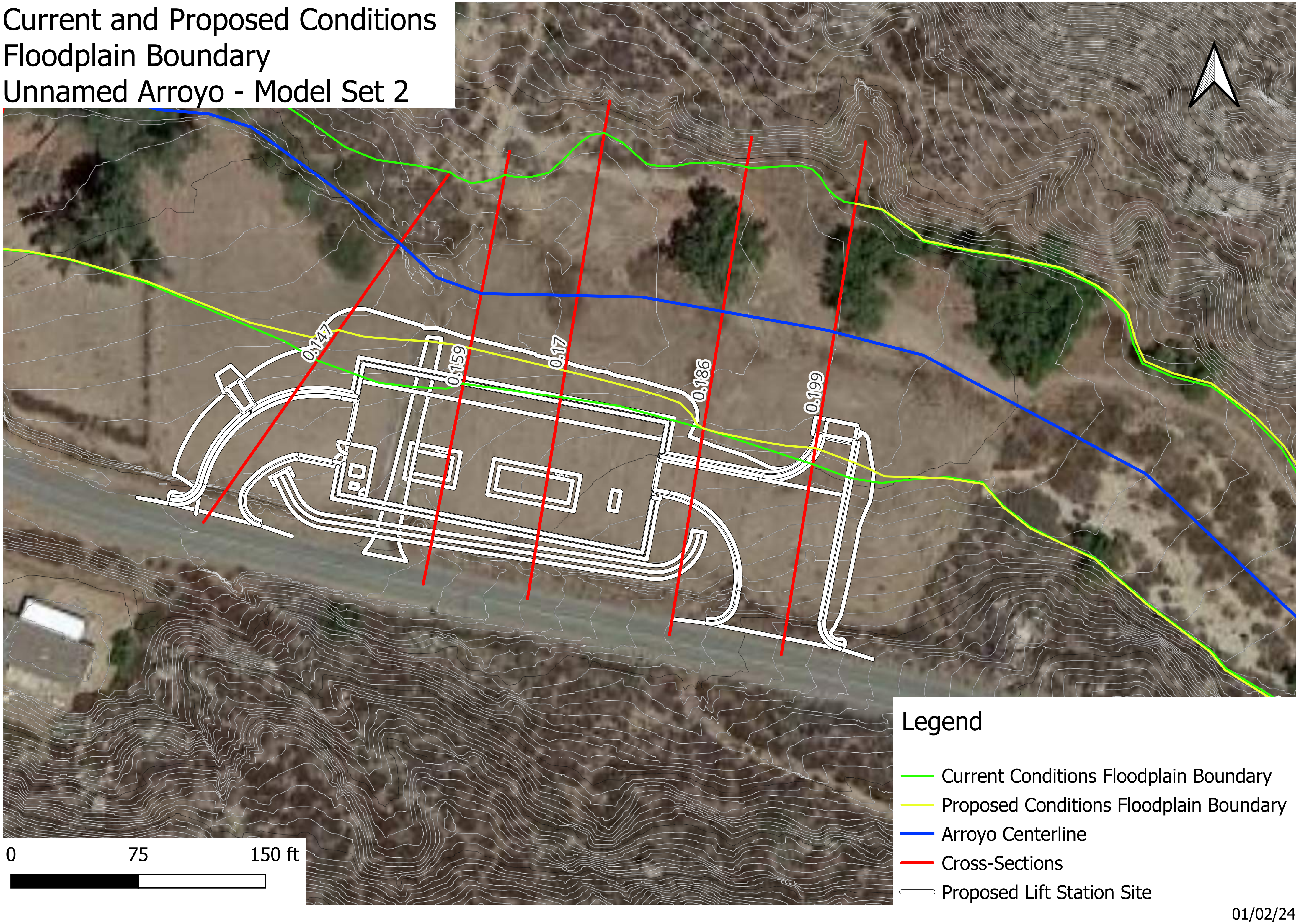
PROPOSED CONDITIONS RESULTS TABLE

HEC-RAS Plan: UNTMC-100YR-24HR-PROP(OBn0.1) River: UNT Mission Cany Reach: Reach 1 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	0.394	PF 1	622.00	1927.94	1932.07	1932.07	1933.75	0.013781	10.88	75.68	27.19	0.96
Reach 1	0.319	PF 1	622.00	1896.97	1902.67	1902.67	1904.98	0.014399	13.77	78.50	20.52	1.03
Reach 1	0.267	PF 1	622.00	1885.00	1888.22	1887.98	1888.74	0.032690	11.28	147.16	88.43	1.14
Reach 1	0.199	PF 1	622.00	1876.90	1879.78	1879.41	1880.07	0.017363	9.91	219.08	144.79	1.06
Reach 1	0.186	PF 1	622.00	1875.50	1878.38	1878.22	1878.71	0.020759	10.50	213.36	156.25	1.13
Reach 1	0.170	PF 1	622.00	1874.00	1877.19	1876.65	1877.39	0.010982	8.23	250.54	142.17	0.84
Reach 1	0.159	PF 1	622.00	1873.47	1875.85	1875.85	1876.65	0.012275	9.29	161.19	104.29	1.10
Reach 1	0.147	PF 1	622.00	1870.88	1874.71	1874.71	1875.47	0.010223	10.06	193.73	114.21	0.97
Reach 1	0.098	PF 1	622.00	1863.96	1869.24	1869.24	1870.02	0.006223	9.39	226.01	142.59	0.74
Reach 1	0.095		Culvert									
Reach 1	0.092	PF 1	622.00	1862.99	1866.53	1866.53	1867.76	0.010209	11.28	131.76	54.03	1.07
Reach 1	0.042	PF 1	622.00	1859.50	1863.57	1863.57	1864.28	0.010238	10.49	202.71	117.52	0.95
Reach 1	0.040		Culvert									
Reach 1	0.038	PF 1	622.00	1859.00	1862.85	1862.85	1863.69	0.008292	8.44	154.98	107.01	0.90
Reach 1	0.023	PF 1	622.00	1859.00	1862.29	1861.52	1862.64	0.005007	6.57	232.41	110.71	0.71

Appendix E

Floodplain Mapping of Unnamed Arroyo at Proposed Site



Current and Proposed Conditions
Floodplain Boundary
Unnamed Arroyo - Model Set 2
0.147
0.159
0.17
0.186
0.199
Legend
Current Conditions Floodplain Boundary
Proposed Conditions Floodplain Boundary
Arroyo Centerline
Cross-Sections
Proposed Lift Station Site
0
75
150 ft
01/02/24

Appendix F

Elevation Certificate Form

National Flood Insurance Program

Elevation Certificate

and Instructions

2022 EDITION

FEMA

U.S. DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
National Flood Insurance Program

ELEVATION CERTIFICATE AND INSTRUCTIONS

PAPERWORK REDUCTION ACT NOTICE

Public reporting burden for this data collection is estimated to average 3.75 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and submitting this form. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street SW, Washington, DC 20742, Paperwork Reduction Project (1660-0008). **NOTE: Do not send your completed form to this address.**

PRIVACY ACT STATEMENT

Authority: Title 44 CFR § 61.7 and 61.8.

Principal Purpose(s): This information is being collected for the primary purpose of documenting compliance with National Flood Insurance Program (NFIP) floodplain management ordinances for new or substantially improved structures in designated Special Flood Hazard Areas. This form may also be used as an optional tool for a Letter of Map Amendment (LOMA), Conditional LOMA (CLOMA), Letter of Map Revision Based on Fill (LOMR-F), or Conditional LOMR-F (CLOMR-F), or for flood insurance rating purposes in any flood zone.

Routine Use(s): The information on this form may be disclosed as generally permitted under 5 U.S.C. § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/ FEMA-003 – *National Flood Insurance Program Files System of Records Notice* 79 Fed. Reg. 28747 (May 19, 2014) and upon written request, written consent, by agreement, or as required by law.

Disclosure: The disclosure of information on this form is voluntary; however, failure to provide the information requested may impact the flood insurance premium through the NFIP. Information will only be released as permitted by law.

PURPOSE OF THE ELEVATION CERTIFICATE

The Elevation Certificate is an important administrative tool of the NFIP. It can be used to provide elevation information necessary to ensure compliance with community floodplain management ordinances, to inform the proper insurance premium, and to support a request for a LOMA, CLOMA, LOMR-F, or CLOMR-F.

The Elevation Certificate is used to document floodplain management compliance for Post-Flood Insurance Rate Map (FIRM) buildings, which are buildings constructed after publication of the FIRM, located in flood Zones A1–A30, AE, AH, AO, A (with Base Flood Elevation (BFE)), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO, and A99. It may also be used to provide elevation information for Pre-FIRM buildings or buildings in any flood zone.

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt floodplain management regulations that specify minimum requirements for reducing flood losses. One such requirement is for the community to obtain the elevation of the lowest floor (including basement) of all new and substantially improved buildings, and maintain a record of such information. The Elevation Certificate provides a way for a community to document compliance with the community's floodplain management ordinance.

Use of this certificate does not provide a waiver of the flood insurance purchase requirement. Only a LOMA or LOMR-F from the Federal Emergency Management Agency (FEMA) can amend the FIRM and remove the federal mandate for a lending institution to require the purchase of flood insurance. However, the lending institution has the option of requiring flood insurance even if a LOMA/LOMR-F has been issued by FEMA. The Elevation Certificate may be used to support a LOMA, CLOMA, LOMR-F, or CLOMR-F request. Lowest Adjacent Grade (LAG) elevations certified by a land surveyor, engineer, or architect, as authorized by state law, will be required if the certificate is used to support a LOMA, CLOMA, LOMR-F, or CLOMR-F request. A LOMA, CLOMA, LOMR-F, or CLOMR-F request must be submitted with either a completed FEMA MT-EZ or MT-1 application package, whichever is appropriate. If the certificate will only be completed to support a LOMA, CLOMA, LOMR-F, or CLOMR-F request, there is an option to document the certified LAG elevation on the Elevation Form included in the MT-EZ and MT-1 application.

This certificate is used only to certify building elevations. A separate certificate is required for floodproofing. Under the NFIP, non-residential buildings can be floodproofed up to or above the BFE. A floodproofed building is a building that has been designed and constructed to be watertight (substantially impermeable to floodwaters) below the BFE. Floodproofing of residential buildings is not permitted under the NFIP unless FEMA has granted the community an exception for residential floodproofed basements. The community must adopt standards for design and construction of floodproofed basements before FEMA will grant a basement exception. For both floodproofed non-residential buildings and residential floodproofed basements in communities that have been granted an exception by FEMA, a floodproofing certificate is required.

The expiration date on the form herein does not apply to certified and completed Elevation Certificates, as a completed Elevation Certificate does not expire, unless there is a physical change to the building that invalidates information in Section A Items A8 or A9, Section C, Section E, or Section H. In addition, this form is intended for the specific building referenced in Section A and is not invalidated by the transfer of building ownership.

Additional guidance can be found in FEMA Publication 467-1, *Floodplain Management Bulletin: Elevation Certificate*.

U.S. DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
National Flood Insurance Program

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19

Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

SECTION A – PROPERTY INFORMATION

FOR INSURANCE COMPANY USE

Policy Number: ______

Company NAIC Number: ______

A1. Building Owner's Name: ______

A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: ______

City: ______ State: ______ ZIP Code: ______

A3. Property Description (e.g., Lot and Block Numbers or Legal Description) and/or Tax Parcel Number: ______

A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.): ______

A5. Latitude/Longitude: Lat. ______ Long. ______ Horizontal Datum: ☐ NAD 1927 ☐ NAD 1983 ☐ WGS 84

A6. Attach at least two and when possible four clear photographs (one for each side) of the building (see Form pages 7 and 8).

A7. Building Diagram Number: ______

A8. For a building with a crawlspace or enclosure(s):

a) Square footage of crawlspace or enclosure(s): ______ sq. ft.

b) Is there at least one permanent flood opening on two different sides of each enclosed area? ☐ Yes ☐ No ☐ N/A

c) Enter number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade:
Non-engineered flood openings: ______ Engineered flood openings: ______

d) Total net open area of non-engineered flood openings in A8.c: ______ sq. in.

e) Total rated area of engineered flood openings in A8.c (attach documentation – see Instructions): ______ sq. ft.

f) Sum of A8.d and A8.e rated area (if applicable – see Instructions): ______ sq. ft.

A9. For a building with an attached garage:

a) Square footage of attached garage: ______ sq. ft.

b) Is there at least one permanent flood opening on two different sides of the attached garage? ☐ Yes ☐ No ☐ N/A

c) Enter number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade:
Non-engineered flood openings: ______ Engineered flood openings: ______

d) Total net open area of non-engineered flood openings in A9.c: ______ sq. in.

e) Total rated area of engineered flood openings in A9.c (attach documentation – see Instructions): ______ sq. ft.

f) Sum of A9.d and A9.e rated area (if applicable – see Instructions): ______ sq. ft.

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1.a. NFIP Community Name: ______ B1.b. NFIP Community Identification Number: ______

B2. County Name: ______ B3. State: ______ B4. Map/Panel No.: ______ B5. Suffix: ______

B6. FIRM Index Date: ______ B7. FIRM Panel Effective/Revised Date: ______

B8. Flood Zone(s): ______ B9. Base Flood Elevation(s) (BFE) (Zone AO, use Base Flood Depth): ______

B10. Indicate the source of the BFE data or Base Flood Depth entered in Item B9:
☐ FIS ☐ FIRM ☐ Community Determined ☐ Other: ______

B11. Indicate elevation datum used for BFE in Item B9: ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: ______

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes ☐ No
Designation Date: ______ ☐ CBRS ☐ OPA

B13. Is the building located seaward of the Limit of Moderate Wave Action (LiMWA)? ☐ Yes ☐ No

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: ____________________

City: ____________________ State: ________ ZIP Code: ____________

FOR INSURANCE COMPANY USE

Policy Number: ____________

Company NAIC Number: ____________

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction

*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations – Zones A1–A30, AE, AH, AO, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO, A99. Complete Items C2.a–h below according to the Building Diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: ____________________ Vertical Datum: ____________________

Indicate elevation datum used for the elevations in items a) through h) below.

☐ NGVD 1929 ☐ NAVD 1988 ☐ Other: ____________________

Datum used for building elevations must be the same as that used for the BFE. Conversion factor used? ☐ Yes ☐ No

If Yes, describe the source of the conversion factor in the Section D Comments area.

Check the measurement used:

a) Top of bottom floor (including basement, crawlspace, or enclosure floor):	____________	☐ feet	☐ meters
b) Top of the next higher floor (see Instructions):	____________	☐ feet	☐ meters
c) Bottom of the lowest horizontal structural member (see Instructions):	____________	☐ feet	☐ meters
d) Attached garage (top of slab):	____________	☐ feet	☐ meters
e) Lowest elevation of Machinery and Equipment (M&E) servicing the building (describe type of M&E and location in Section D Comments area):	____________	☐ feet	☐ meters
f) Lowest Adjacent Grade (LAG) next to building: ☐ Natural ☐ Finished	____________	☐ feet	☐ meters
g) Highest Adjacent Grade (HAG) next to building: ☐ Natural ☐ Finished	____________	☐ feet	☐ meters
h) Finished LAG at lowest elevation of attached deck or stairs, including structural support:	____________	☐ feet	☐ meters

SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by state law to certify elevation information. *I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.*

Were latitude and longitude in Section A provided by a licensed land surveyor? ☐ Yes ☐ No

☐ Check here if attachments and describe in the Comments area.

Certifier's Name: ____________________ License Number: ____________

Title: ____________________

Company Name: ____________________

Address: ____________________

City: ____________________ State: ________ ZIP Code: ____________

Signature: ____________________ Date: ____________

Telephone: ____________ Ext.: ______ Email: ____________________

Place Seal Here

Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

Comments (including source of conversion factor in C2; type of equipment and location per C2.e; and description of any attachments):

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: ______

City: ______ State: ______ ZIP Code: ______

FOR INSURANCE COMPANY USE

Policy Number: ______

Company NAIC Number: ______

SECTION E – BUILDING MEASUREMENT INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO, ZONE AR/AO, AND ZONE A (WITHOUT BFE)

For Zones AO, AR/AO, and A (without BFE), complete Items E1–E5. For Items E1–E4, use natural grade, if available. If the Certificate is intended to support a Letter of Map Change request, complete Sections A, B, and C. Check the measurement used. In Puerto Rico only, enter meters.

Building measurements are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction

*A new Elevation Certificate will be required when construction of the building is complete.

E1. Provide measurements (C.2.a in applicable Building Diagram) for the following and check the appropriate boxes to show whether the measurement is above or below the natural HAG and the LAG.

a) Top of bottom floor (including basement,crawlspace, or enclosure) is: ______ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

b) Top of bottom floor (including basement,crawlspace, or enclosure) is: ______ ☐ feet ☐ meters ☐ above or ☐ below the LAG.

E2. For Building Diagrams 6–9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 1–2 of Instructions), the next higher floor (C2.b in applicable Building Diagram) of the building is: ______ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E3. Attached garage (top of slab) is: ______ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E4. Top of platform of machinery and/or equipment servicing the building is: ______ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown The local official must certify this information in Section G.

SECTION F – PROPERTY OWNER (OR OWNER'S AUTHORIZED REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without BFE) or Zone AO must sign here. *The statements in Sections A, B, and E are correct to the best of my knowledge*

☐ Check here if attachments and describe in the Comments area.

Property Owner or Owner's Authorized Representative Name: ______

Address: ______

City: ______ State: ______ ZIP Code: ______

Signature: ______ Date: ______

Telephone: ______ Ext.: ______ Email: ______

Comments:

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: ____________________

City: ____________________ State: ________ ZIP Code: ____________

FOR INSURANCE COMPANY USE

Policy Number: ____________

Company NAIC Number: ____________

SECTION G – COMMUNITY INFORMATION (RECOMMENDED FOR COMMUNITY OFFICIAL COMPLETION)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Section A, B, C, E, G, or H of this Elevation Certificate. Complete the applicable item(s) and sign below when:

G1. ☐ The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by state law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2.a. ☐ A local official completed Section E for a building located in Zone A (without a BFE), Zone AO, or Zone AR/AO, or when item E5 is completed for a building located in Zone AO.

G2.b. ☐ A local official completed Section H for insurance purposes.

G3. ☐ In the Comments area of Section G, the local official describes specific corrections to the information in Sections A, B, E and H.

G4. ☐ The following information (Items G5–G11) is provided for community floodplain management purposes.

G5. Permit Number: ____________ G6. Date Permit Issued: ____________

G7. Date Certificate of Compliance/Occupancy Issued: ____________

G8. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G9.a. Elevation of as-built lowest floor (including basement) of the building: ____________ ☐ feet ☐ meters Datum: ____________

G9.b. Elevation of bottom of as-built lowest horizontal structural member: ____________ ☐ feet ☐ meters Datum: ____________

G10.a. BFE (or depth in Zone AO) of flooding at the building site: ____________ ☐ feet ☐ meters Datum: ____________

G10.b. Community's minimum elevation (or depth in Zone AO)requirement for the lowest floor or lowest horizontal structural member: ____________ ☐ feet ☐ meters Datum: ____________

G11. Variance issued? ☐ Yes ☐ No If yes, attach documentation and describe in the Comments area.

The local official who provides information in Section G must sign here. *I have completed the information in Section G and certify that it is correct to the best of my knowledge. If applicable, I have also provided specific corrections in the Comments area of this section.*

Local Official's Name: ____________________ Title: ____________________

NFIP Community Name: ____________________

Telephone: Ext.: ______ Email: ____________________

Address: ____________________

City: ____________________ State: ________ ZIP Code: ____________

Signature: ____________________ Date: ____________

Comments (including type of equipment and location, per C2.e; description of any attachments; and corrections to specific information in Sections A, B, D, E, or H):

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: ____________ City: ____________ State: ________ ZIP Code: ____________	**FOR INSURANCE COMPANY USE** Policy Number: ____________ Company NAIC Number: ________

SECTION H – BUILDING'S FIRST FLOOR HEIGHT INFORMATION FOR ALL ZONES (SURVEY NOT REQUIRED) (FOR INSURANCE PURPOSES ONLY)

The property owner, owner's authorized representative, or local floodplain management official may complete Section H for all flood zones to determine the building's first floor height for insurance purposes. Sections A, B, and I must also be completed. Enter heights to the nearest tenth of a foot (nearest tenth of a meter in Puerto Rico). ***Reference the Foundation Type Diagrams (at the end of Section H Instructions) and the appropriate Building Diagrams (at the end of Section I Instructions) to complete this section.***

H1. Provide the height of the top of the floor (as indicated in Foundation Type Diagrams) above the Lowest Adjacent Grade (LAG):

a) **For Building Diagrams 1A, 1B, 3, and 5–9.** Top of bottom floor (include above-grade floors only for buildings with subgrade crawlspaces or enclosure floors) is: ____________ ☐ feet ☐ meters ☐ above the LAG

b) **For Building Diagrams 2A, 2B, 4, and 6–9.** Top of next higher floor (i.e., the floor above basement, crawlspace, or enclosure floor) is: ____________ ☐ feet ☐ meters ☐ above the LAG

H2. Is **all** Machinery and Equipment servicing the building (as listed in Item H2 instructions) elevated to or above the floor indicated by the H2 arrow (shown in the Foundation Type Diagrams at end of Section H instructions) for the appropriate Building Diagram?

☐ Yes ☐ No

SECTION I – PROPERTY OWNER (OR OWNER'S AUTHORIZED REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and H must sign here. *The statements in Sections A, B, and H are correct to the best of my knowledge.* **Note:** If the local floodplain management official completed Section H, they should indicate in Item G2.b and sign Section G.

☐ Check here if attachments are provided (including required photos) and describe each attachment in the Comments area.

Property Owner or Owner's Authorized Representative Name: ____________

Address: ____________

City: ____________ State: ________ ZIP Code: ____________

Signature: ____________ Date: ____________

Telephone: Ext.: ______ Email: ____________

Comments:

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19

BUILDING PHOTOGRAPHS

See Instructions for Item A6.

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: ____________________

City: ____________________ State: ________ ZIP Code: ____________

FOR INSURANCE COMPANY USE

Policy Number: ____________

Company NAIC Number: ________

Instructions: Insert below at least two and when possible four photographs showing each side of the building (for example, may only be able to take front and back pictures of townhouses/rowhouses). Identify all photographs with the date taken and "Front View," "Rear View," "Right Side View," or "Left Side View." Photographs must show the foundation. When flood openings are present, include at least one close-up photograph of representative flood openings or vents, as indicated in Sections A8 and A9.

Photo One

Photo One Caption:

Clear Photo One

Photo Two

Photo Two Caption:

Clear Photo Two

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19

BUILDING PHOTOGRAPHS

Continuation Page

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: ____ City: ____ State: ____ ZIP Code: ____	**FOR INSURANCE COMPANY USE** Policy Number: ____ Company NAIC Number: ____

Insert the third and fourth photographs below. Identify all photographs with the date taken and "Front View," "Rear View," "Right Side View," or "Left Side View." When flood openings are present, include at least one close-up photograph of representative flood openings or vents, as indicated in Sections A8 and A9.

Photo Three

Photo Three Caption: Clear Photo Three

Photo Four

Photo Four Caption: Clear Photo Four

INSTRUCTIONS FOR COMPLETING THE ELEVATION CERTIFICATE

The Elevation Certificate is to be completed by a land surveyor, engineer, or architect who is authorized by state law to certify elevation information when elevation information is required or used for Zones A1–A30, AE, AH, AO, A (with Base Flood Elevation (BFE)), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO, or A99.

Community officials who are authorized by law or ordinance to provide floodplain management information (herein referred to as “local floodplain management official”) may also complete this form. For Zones AO, AR/AO, and A (without BFE), a local floodplain management official, a property owner, or an owner's authorized representative may provide floodplain management compliance information on this certificate in Section E, unless the elevations are intended for use in supporting a request for a LOMA, CLOMA, LOMR-F, or CLOMR-F. Certified elevations must be included if the purpose of completing the Elevation Certificate is to obtain a LOMA, CLOMA, LOMR-F, or CLOMR-F.

The property owner, the owner's authorized representative, or local floodplain management official can complete Section A and Section B. The partially completed form can then be given to the land surveyor, engineer, or architect to complete Section C. The land surveyor, engineer, or architect should verify the information provided by the property owner or owner's representative to ensure that this certificate is complete.

For insurance purposes only, a local floodplain management official, a property owner, or an owner's authorized representative may provide First Floor Height details in Section H for any zone.

In Puerto Rico only, elevations for building information and flood hazard information may be entered in meters.

Note: Section C can be used for insurance and compliance in any zone; however, Section E can be used only for compliance in Zone AO and Zone A.

SECTION A – PROPERTY INFORMATION

Items A1–A4. This section identifies the building, its location, and its owner. Enter the name(s) of the building owner(s), the building's complete street address or property description (e.g., lot and block numbers or legal description), and/or tax parcel number. If the building's address is different from the owner's address, enter the address of the building being certified. If the address is a rural route or a Post Office box number, enter the lot and block numbers, the tax parcel number, the legal description, or an abbreviated location description based on distance and direction from a fixed point of reference. For the purposes of this certificate, "building" means both a building and a manufactured (mobile) home. For properties with multiple buildings, include a description for the specific building.

A map may be attached to this certificate to show the location of the building on the property. A tax map, Flood Insurance Rate Map (FIRM), or detailed community map is appropriate. If no map is available, provide a sketch of the property location, and the location of the building on the property. Include appropriate landmarks such as nearby roads, intersections, and bodies of water. For building use, indicate whether the building is residential, non-residential, an addition to an existing residential or non- residential building, an accessory building (e.g., garage), or other type of structure. Use the Comments area of the appropriate section if needed, or attach additional comments.

Item A5. Provide latitude and longitude coordinates for the center of the front of the building. Use either decimal degrees (e.g., 39.504322°, −110.758522°) or degrees, minutes, seconds (e.g., 39° 30' 15.56", −110° 45' 30.68") format. If decimal degrees are used, provide coordinates to at least six decimal places or better. When using degrees, minutes, seconds, provide seconds to at least two decimal places or better. Provide the datum of the latitude and longitude coordinates (FEMA prefers the use of NAD 1983). Indicate the method or source used to determine the latitude and longitude in the Comments area of the appropriate section. When the latitude and longitude are provided by a land surveyor, check the "Yes" box in Section D.

Item A6. The certifier must provide at least two and when possible four photographs showing each side of the building taken within 90 days from the date of certification. The photographs must be taken with views confirming the building description and Building Diagram number provided in Item A7. To the extent possible, these photographs should show the entire building including foundation. In addition, when applicable, provide a photograph of the foundation showing a representative example of the flood openings or vents. All photographs must be in color and measure at least 3"×3". Digital photographs are acceptable. Additional photographs may be requested by local floodplain management officials or for insurance purposes to show additional detail regarding the building characteristics or features.

Item A7. Select the Building Diagram (shown on pages 17-19) that best represents the building. Then enter the diagram number and use the diagram to identify and determine the appropriate elevations requested in Items C2.a–h. If you are unsure of the correct diagram, select the diagram that most closely resembles the building being certified.

Item A8.a. Provide the square footage of the crawlspace or enclosure(s) below the lowest elevated floor of an elevated building with or without permanent flood openings. Take the measurement from the outside of the crawlspace or enclosure(s). Examples of elevated buildings constructed with crawlspace and enclosure(s) are shown in Diagrams 6-9 on pages 18-19. Diagram 2A, 2B, 4, or 9 should be used for a building constructed with a crawlspace floor that is below the exterior grade on all sides. If there is no crawlspace or enclosure, enter "N/A" for Items A8.a-f.

Item A8.b. Indicate if there is at least one permanent flood opening within 1.0 foot of the adjacent grade on at least two exterior walls of each enclosed area identified in A8.a. A permanent flood opening is a flood vent or other opening that allows the free passage of water automatically in both directions without human intervention. If the crawlspace or enclosure(s) have no permanent flood openings, or if none of the openings are within 1.0 foot above adjacent grade, enter “0” (zero) in Item A8.c-f. If there is no crawlspace or enclosure, enter “N/A”.

SECTION A – PROPERTY INFORMATION *(Continued)*

Item A8.c. Enter the total number of permanent non-engineered and/or engineered flood openings in the crawlspace or enclosure(s) that are no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. If the interior grade elevation is used, note this in the Comments area of Section D.

Item A8.d. Enter the total measured net open area of permanent non-engineered flood openings indicated in A8.c in square inches, excluding any bars, louvers, or other covers of the permanent flood openings. Non-engineered openings that meet the requirements of NFIP Technical Bulletin 1 are assumed to provide one square foot of rated area for each square inch of net open area. If the net open area cannot be measured, provide in the Comments area of the appropriate section the size of the flood openings without consideration of any covers and indicate the type of cover that exists in the flood openings.

Item A8.e. Enter the total rated area of the permanent engineered flood openings indicated in A8.c, in square feet. Attach a copy of the Individual Engineered Flood Openings Certification for a specific building or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES) for all engineered openings, and indicate the manufacturer's name and model number in the Comments area of the appropriate section, if applicable. Flood openings cannot be considered engineered flood openings without documentation. If no documentation is available/provided, enter the net open (unobstructed) area of the flood openings in A8.d instead.

Item A8.f. Complete only if permanent engineered and permanent non-engineered flood openings are both present. Enter the sum of A8.d (net open area of all non-engineered openings) and A8.e (total rated area of all engineered openings). Non-engineered openings that meet the requirements of NFIP Technical Bulletin 1 are assumed to provide one square foot of rated area for each square inch of net open area. For example, a non-engineered opening with 140 sq. in. of net open area (i.e., rated for 140 sq. ft. of enclosure area), combined with two (2) engineered openings rated for 200 sq. ft. each, would yield 140 + 400 = 540 sq. ft. rated area. If either A8.d or A8.e is “0”, then enter “N/A” for A8.f.

Item A9.a. Provide the square footage of the attached garage with or without permanent flood openings. Take the measurement from the outside of the garage. If there is no attached garage, enter "N/A" for items A9.a-f.

Item A9.b. Indicate if there is at least one permanent flood opening within 1.0 foot of the adjacent grade on at least two exterior walls of the attached garage identified in A9.a. If the attached garage has no permanent flood openings, or if none of the openings are within 1.0 foot above adjacent grade, enter “0” (zero) in Items A9.c-f. If there is no attached garage, enter “N/A”.

Item A9.c. Enter the total number of permanent non-engineered and/or engineered flood openings in the attached garage that are no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. This includes any openings that are in the garage door that are no higher than 1.0 foot above the adjacent grade. If the interior grade elevation is used, note this in the Comments area of Section D.

Item A9.d. Enter the total measured net open area of permanent non-engineered flood openings indicated in A9.c in square inches, excluding any bars, louvers, or other covers of the permanent flood openings, and enter the total in Item A9.d. Non-engineered openings that meet the requirements of NFIP Technical Bulletin 1 are assumed to provide one square foot of rated area for each square inch of net open area. If the net open area cannot be measured, provide in the Comments area of the appropriate section the size of the flood openings without consideration of any covers and indicate the type of cover that exists in the flood openings.

Item A9.e. Enter the total rated area of the permanent engineered flood openings indicated in A9.c in square feet. Attach a copy of the Individual Engineered Flood Openings Certification for a specific building or an Evaluation Report issued by the ICC ES for all engineered openings, and indicate the manufacturer's name and model number in the Comments area of the appropriate section, if applicable. Flood openings cannot be considered engineered flood openings without documentation. If no documentation is available/provided, enter the net open (unobstructed) area of the flood openings in A9.d instead.

Item A9.f. Complete only if permanent engineered and permanent non-engineered flood openings are both present. Enter the sum of A9.d (net open area of all non-engineered openings) and A9.e (total rated area of all engineered openings). Non-engineered openings that meet the requirements of NFIP Technical Bulletin 1 are assumed to provide one square foot of rated area for each square inch of net open area. For example, a non-engineered opening with 140 sq. in. of net open area (i.e., rated for 140 sq. ft. of enclosure area), combined with two (2) engineered openings rated for 200 sq. ft. each, would yield 140 + 400 = 540 sq. ft. rated area. If either A9.d or A9.e is “0”, then enter “N/A” for A9.f.

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

Complete the Elevation Certificate using the Flood Insurance Study (FIS) and FIRM in effect at the time of the certification.

The information for Section B is obtained by reviewing the FIS and the FIRM panel that includes the building's location. Information about the current FIS and FIRM is available from FEMA by visiting or contacting the local floodplain management official. If a Letter of Map Amendment (LOMA), Letter of Map Revision Based on Fill (LOMR-F), or Letter of Map Revision (LOMR) has been issued by FEMA, please provide the letter date and case number in the Comments area of Section D or Section G, as appropriate.

For a building in an area that was mapped in one community but is now in another community due to annexation or dissolution, enter the community name and six-digit Community Identification Number of the community in which the building is now located in Items B1.a and B1.b; the name of the county or new county, if necessary, in Item B2; and the FIRM index date for the community identified in B1.a, in Item B6. Enter information from the actual FIRM panel that shows the building location, even if it is the FIRM for the previous jurisdiction, in Items B4, B5, B7, B8, and B9.

If the map in effect at the time of the building's construction was other than the current FIRM, and you have the past map information pertaining to the building, provide the information in the Comments area of Section D.

Note: Indicate in the Comments area of Section D if using information based on best available data, such as base-level engineering or advisory flood hazard data (contact the local floodplain management official to confirm).

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION *(Continued)*

Items B1.a–b NFIP Community Name and Community Identification Number. Enter the complete name of the community in which the building is located in B1.a, and the associated six-digit Community Identification Number in B1.b. For an unincorporated area of a county, enter the county name and "unincorporated area", and the six-digit number of the county. For a newly incorporated community, use the name and six-digit number of the new community. Under the NFIP, a "community" is any state or area or political subdivision thereof, or any Indian tribe or authorized native organization which has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction. To determine the current community number, see the NFIP *Community Status Book*, available on FEMA's website at .

Item B2. County Name. Enter the name of the county or counties in which the community is located. For an unincorporated area of a county, enter the county name. For an independent city, enter "independent city."

Item B3. State. Enter the two-letter state abbreviation (for example, VA, TX, CA).

Items B4–B5. Map/Panel Number and Suffix. Enter the 10-character "Map Number" or "Community Panel Number" shown on the FIRM where the building or manufactured (mobile) home is located. For maps in a county-wide format, the sixth character of the "Map Number" is the letter "C" followed by a four-digit map number. For maps not in a county-wide format, enter the "Community Panel Number" shown on the FIRM.

Item B6. FIRM Index Date. Enter the effective date or the map revised date shown on the FIRM Index.

Item B7. FIRM Panel Effective/Revised Date. Enter the effective date shown on the current FIRM panel. The current FIRM panel effective date can be determined by visiting or contacting the local floodplain management official. If the area where the building is located was revised by a LOMR, include the LOMR effective date and the LOMR case number in the comments area of Section D.

Item B8. Flood Zone(s). Enter the flood zone, or flood zones, in which the building is located. All flood zones containing the letter "A" or "V" are considered Special Flood Hazard Areas (SFHAs). Each flood zone is defined in the legend of the FIRM panel on which it appears. If the area where the building is located was revised by a LOMA, CLOMA, LOMR-F, or CLOMR-F, include the flood zone shown on the LOMA, CLOMA, LOMR-F, or CLOMR-F, and add the effective date and case number in the comments area of Section D.

Item B9. Base Flood Elevation(s) (BFE). Using the appropriate Flood Insurance Study (FIS) Profile, FIS Data Table (e.g. Transect, Floodway, etc.), or FIRM panel, locate the property and enter the BFE (or base flood depth) of the building site to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico). If the building is located in more than one flood zone in Item B8, list all appropriate BFEs in Item B9.

BFEs are shown in the FIS or on a FIRM for Zones A1–A30, AE, AH, V1–V30, VE, AR, AR/A, AR/AE, AR/A1–A30, and AR/AH; base flood depths are shown for Zones AO and AR/AO. Use the AR BFE (or base flood depth) if the building is located in any of these zones: AR/A, AR/AE, AR/A1–A30, AR/AH, or AR/AO.

In A or V zones where BFEs are not provided in the FIS or on the FIRM, BFEs may be available from another source. For example, the community may have established BFEs or obtained BFE data from other sources (e.g., Base Level Engineering) for the building site. For subdivisions and other developments of more than 50 lots or 5 acres in Zone A, establishment of BFEs is required by the community's floodplain management ordinance. If a BFE is obtained from another source, enter the BFE in Item B9. The BFE entered in Item B9 must be based on hydrologic and hydraulic analyses. In an A Zone where BFEs are not obtained from another source, enter N/A in Item B9 and complete Section E.

Item B10. Indicate the source of the BFE or base flood depth that you entered in Item B9. If the BFE is from a source other than the FIS, FIRM, or community, include the name of the study, the agency or company that produced it, and the date when the study was completed. Visit msc.fema.gov or contact the local floodplain management official to access the current FIS and FIRM.

Item B11. Indicate the elevation datum to which the elevations on the applicable FIRM are referenced as shown on the map legend. The vertical datum is shown in the Map Legend and/or the Notes to Users on the FIRM.

Item B12. Indicate whether the building is located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA). OPAs are portions of coastal barriers that are owned by Federal, State, or local governments or by certain non-profit organizations and used primarily for natural resources protection. CBRS areas and OPAs are no longer shown on the FIRM; please use the maps available at to complete Item B12. Federal flood insurance is prohibited in designated CBRS areas or OPAs for buildings or manufactured (mobile) homes built or substantially improved after the date of the CBRS or OPA designation. For the first CBRS designations, that date is October 1, 1983. Information about CBRS areas and OPAs may be obtained on the FEMA website at .

Item B13. Indicate whether the building is located seaward of the Limit of Moderate Wave Action (LiMWA). If the LiMWA is not shown on the FIRM, check the "No" box. Information about the LiMWA and other coastal flood zones may be obtained on the FEMA website at .

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

Complete Section C if the building is located in any of Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, or A99. If the Certificate is being completed to demonstrate compliance with local floodplain management requirements, contact the local floodplain management official to find out any additional requirements. Section C may also be completed for insurance purposes to determine the building's First Floor Height in any flood zone (including Zones AO, AR/AO, B, C, X and D). In addition, complete Section C if this certificate is being used to support a request for a LOMA, CLOMA, LOMR-F, or CLOMR-F.

To ensure that all required elevations are obtained, it may be necessary to physically enter the building (for instance, if the building has a basement or sunken living room, split-level construction, or Machinery and Equipment (M&E)).

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED) *(Continued)*

Land surveyors may not be able to gain access to some crawlspaces to shoot the elevation of the crawlspace floor. If access to the crawlspace is limited or cannot be gained, follow one of these procedures.

- Use a yardstick or tape measure to measure the height from the floor of the crawlspace to the "next higher floor," and then subtract the crawlspace height from the elevation of the "next higher floor." If there is no access to the crawlspace, use the exterior grade next to the structure to measure the height of the crawlspace to the "next higher floor."
- Contact the local floodplain management official of the community in which the building is located. The community may have documentation of the elevation of the crawlspace floor as part of the permit issued for the building.
- If the property owner has documentation or knows the height of the crawlspace floor to the next higher floor, try to verify this by looking inside the crawlspace through any openings or vents.

In all three cases, use the Comments area of Section D to provide the elevation and a brief description of how the elevation was obtained.

Note: If any item does not apply to the building, enter "N/A" for not applicable.

Item C1. Indicate whether the elevations to be entered in this section are based on construction drawings, a building under construction, or finished construction. For either of the first two choices, a post-construction Elevation Certificate will be required when construction is complete. If the building is under construction, include only those elevations that can be surveyed in Items C2.a–h. Use the Comments area of Section D to provide elevations obtained from the construction plans or drawings. Select "Finished Construction" only when all M&E such as furnaces, water heaters, heat pumps, air conditioners, and elevators and their associated equipment have been installed and the grading around the building is completed.

Item C2. A field survey is required for Items C2.a–h. Most control networks will assign a unique identifier for each benchmark. For example, the National Geodetic Survey uses the Permanent Identifier (PID). For the benchmark utilized, provide the PID or other unique identifier assigned by the maintainer of the benchmark. For GPS survey, indicate the benchmark used for the base station, the Continuously Operating Reference Stations (CORS) sites used for an Online Positioning User Service (OPUS) solution (also attach the OPUS report), or the name of the Real Time Network used.

Also provide the vertical datum for the benchmark elevation. All elevations for the certificate, including the elevations for Items C2.a–h, must use the same datum on which the BFE is based. Show the conversion from the field survey datum used if it differs from the datum used for the BFE entered in Item B9 and indicate the conversion software used. Show the datum conversion, if applicable, in the Comments area of Section D.

For property experiencing ground subsidence, the most recent reference mark elevations must be used for determining building elevations. However, when subsidence is involved, the BFE should not be adjusted.

Note: Enter elevations in Items C2.a–h to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico); if data is surveyed to the nearest hundredth, round to the nearest tenth.

Item C2.a. Enter the elevation measured at the top of the bottom floor (excluding the attached garage) indicated by the selected Building Diagram (Item A7). For buildings elevated on a crawlspace, Building Diagrams 8 and 9, enter the lowest elevation of the top of the crawlspace floor in Item C2.a, whether or not the crawlspace has permanent flood openings (flood vents).

Item C2.b. For Building Diagrams 2A through 9 in any flood zone, including Zones B, C, X, and D, enter the elevation measured at the top of the next higher floor (excluding the attached garage) indicated by the selected Building Diagram (Item A7). For buildings requiring more than two floors or levels to be surveyed, such as those with multiple floors or multi-level enclosures, enter the additional surveyed elevations and floor descriptions in the Section D Comments, and clarify which floors are entered as Item C2.a and C2.b.

Item C2.c. For floodplain management compliance, this elevation is required for all Building Diagrams 5 and 6 in V Zones in areas seaward of the LiMWA, and in other areas regulated for coastal flooding hazards. Enter the elevation measured at the bottom of the lowest horizontal structural member of the floor indicated by the selected Building Diagram (Item A7) or the figure below. This elevation can be entered for Building Diagrams 5 and 6 in any flood zone, including Zones B, C, X, and D. For Building Diagrams other than 5 and 6 (if applicable), enter the C2.c elevation as indicated in the figure below. *If this item does not apply to the building, enter "N/A" for not applicable.*

Item C2.d. If there is an attached garage, enter the lowest elevation for top of attached garage slab. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the Building Diagrams.)

Item C2.e. Enter the lowest platform, floor, or ground elevation supporting the lowest electrical, heating, ventilation, plumbing, and air conditioning M&E and other utilities servicing the building, which may be located in an attached garage or enclosure or on an open utility platform. Note that elevations for the M&E items are required regardless of their location. Local floodplain management officials are required to ensure that ***all*** new M&E servicing the building are protected from flooding. Thus, local officials may require that elevation information for all M&E, including ductwork, be documented on the Elevation Certificate. If the M&E is mounted to a wall, pile, etc., enter the platform elevation of the M&E. Indicate the lowest M&E type and its general location (e.g., on floor inside garage, on platform affixed to exterior wall) in the Comments area of Section D or Section G, as appropriate.

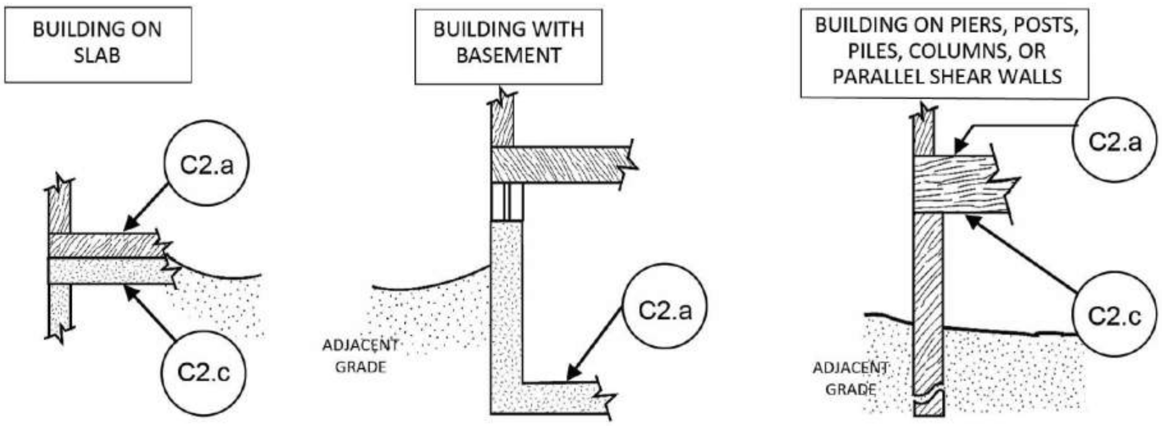
Note: For more guidance on floodplain management compliance for utilities, including M&E, refer to FEMA P-348, *Protecting Building Utility Systems from Flood Damage*. The list of M&E and the elevation requirements for documenting floodplain management compliance are different than the NFIP insurance M&E discount eligibility considerations. See Section H Instructions for additional information.

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED) *(Continued)*

Item C2.f. Enter the finished Lowest Adjacent Grade (LAG) elevation of the ground, sidewalk, or patio slab next to and in direct contact with the building. For a building in Zone AO, use the natural grade elevation, if available. Indicate whether the natural or finished grade was used. If natural grade was used, attach the source of the information (e.g., a grading plan). For buildings under construction in any flood zone, enter the LAG elevation at the time of the survey. **Note:** Natural grade means the undisturbed natural surface of the ground prior to any excavation or fill.

Item C2.g. Enter the finished Highest Adjacent Grade (HAG) elevation of the ground, sidewalk, or patio slab next to and in direct contact with the building. For a building in Zone AO, use the natural grade elevation if available. Indicate whether the natural or finished grade was used. If natural grade was used, attach the source of the information (e.g., a grading plan). For buildings under construction in any flood zone, enter the HAG elevation at the time of the survey.

Item C2.h. Enter the finished LAG elevation of the lowest ground, sidewalk, or patio slab next to and in direct contact with the structurally-attached-deck supports or stairs structurally attached to the building. For buildings under construction in any flood zone, enter the lowest LAG at the time of the survey.



Figures for use in determining Item C2.c

SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This section of the Elevation Certificate may be signed by only a land surveyor, engineer, or architect who is authorized by state law to certify elevation information. Complete as indicated and place your license number, your seal (as allowed by the state licensing board), your signature, and the date in Section D. You are certifying that the information on this certificate represents your best efforts to interpret the data available and that you understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001. Use the Comments area of Section D to provide relevant and clarifying information not specified elsewhere on the certificate, including supporting information for latitude/longitude source for A5; openings for A8/A9; LOMR data for Section B; BFE and BFE source data for B9/B10; datum conversion for C2; grading plan for natural grade used in C2.f-g; machinery type and location for C2.e; and any other relevant information identified in the instructions or needed for clarification. If attachments are included, check the attachments box and describe the attachments in the Comments area.

SECTION E – BUILDING MEASUREMENT INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO, ZONE AR/AO, AND ZONE A (WITHOUT BFE)

Complete Section E if the building is located in Zone AO, Zone AR/AO, or Zone A (without BFE) and the Certificate is being completed for the purpose of documenting compliance with local floodplain management requirements. If the Certificate is being completed to document compliance in other flood zones, including Zone A (with BFE), to support a LOMA, CLOMA, LOMR-F, or CLOMR-F request, or to provide a ground elevation for flood insurance rating, complete Section C instead of Section E. Explain in the Section F Comments area if the measurement provided under Items E1–E4 is not based on the "natural grade." Natural grade means the undisturbed natural surface of the ground prior to any excavation or fill.

Indicate whether the measurements to be entered in this section are based on construction drawings, a building under construction, or finished construction. For either of the first two choices, a post-construction Elevation Certificate will be required when construction is complete. If the building is under construction, include only those measurements that can be determined in Items E1–E4. Use the Comments area of Section F to provide measurements obtained from the construction plans or drawings. Select "Finished Construction" only when all Machinery and Equipment (M&E) such as furnaces, water heaters, heat pumps, air conditioners, and elevators and their associated equipment have been installed and the grading around the building is completed.

Note: Enter heights in Items E1–E4 to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

Items E1.a and b. Enter in Item E1.a the height of the top of the bottom floor (as indicated by C2.a in the selected Building Diagram, Item A7) above or below the natural HAG. Enter in Item E1.b the height of the top of the bottom floor (as indicated by C2.a in the selected Building Diagram, Item A7) above or below the natural LAG. For buildings in Zone AO, the community's floodplain management ordinance requires the lowest floor of the building be elevated above the HAG at least as high as the base flood depth on the FIRM.

SECTION E – BUILDING MEASUREMENT INFORMATION (SURVEY NOT REQUIRED)FOR ZONE AO AND ZONE A (WITHOUT BFE) *(Continued)*

Item E2. For Building Diagrams 6–9 with permanent flood openings (see pages 18–19), enter the height of the next higher floor or elevated floor (as indicated by C2.b in the selected Building Diagram, Item A7) above or below the HAG.

Item E3. Enter the height, in relation to the HAG next to the building, for the top of attached garage slab. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) *If this item does not apply to the building, enter "N/A" for not applicable.*

Item E4. Enter the height, in relation to the HAG next to the building, of the platform elevation that supports the M&E servicing the building. See Item C2.e for additional details on M&E. Indicate the M&E type in the Comments area of Section F.

Item E5. For those communities where this base flood depth is not available, the community will need to determine whether the top of the bottom floor is elevated in accordance with the community's floodplain management ordinance.

SECTION F – PROPERTY OWNER (OR OWNER'S AUTHORIZED REPRESENTATIVE) CERTIFICATION

Complete as indicated. This section is provided for certification of measurements when completing Sections A, B, and E. If Section E is completed by a property owner or property owner's authorized representative in Zone AO, AR/AO, or A (without BFE), then the community should confirm the heights in Section E to ensure compliance with community floodplain management ordinances. If Section E is completed by a local floodplain management official, then complete Item G2.a and Section G instead of Section F. The address entered in this section must be the actual mailing address of the individual who provided the information on the certificate. Check the box as indicated if including attachments and describe in the Comments area.

SECTION G – COMMUNITY INFORMATION (RECOMMENDED FOR COMMUNITY OFFICIAL COMPLETION)

The community official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C, E, G or H of this Elevation Certificate and sign this section. Section C may be completed by the local official per the instructions below for Item G1.

Item G1. Check if Section C is completed with elevation data from other documentation that has been signed and sealed by a licensed land surveyor, engineer, or architect who is authorized by state law to certify elevation information. Indicate the source of the elevation data and the date obtained in the Comments area of Section G. If you are both a community official and a licensed land surveyor, engineer, or architect authorized by state law to certify elevation information, and you performed the actual survey for a building in any flood zones (including Zones A99, B, C, X and D), you must also complete Section D.

Item G2.a. Check if information is entered in Section E by the community for a building in Zone A (without a BFE), Zone AO, or Zone AR/AO, or when the community certifies Item E5 for a building in Zone AO.

Item G2.b. Check if information is entered in Section H by the community for insurance purposes.

Item G3. Check if the community official is correcting information provided in Sections A, B, E and H. Describe corrections in the Comments area of Section G.

Item G4. Check if the information in Items G5–G11 has been completed for community floodplain management purposes to document the as-built lowest floor elevation of the building. Section C of the Elevation Certificate records the elevation of various building components but does not determine the lowest floor of the building or whether the building, as constructed, complies with the community's floodplain management ordinance. This must be done by the community. Items G5–G11 provide a way to document these determinations.

Item G5. Permit Number. Enter the permit number or other identifier to key the Elevation Certificate to the permit issued for the building.

Item G6. Date Permit Issued. Enter the date the permit was issued for the building.

Item G7. Date Certificate of Compliance/Occupancy Issued. Enter the date that the Certificate of Compliance or Occupancy or similar written official documentation of as-built lowest floor elevation was issued by the community as evidence that all work authorized by the floodplain development permit has been completed in accordance with the community's floodplain management laws or ordinances.

Item G8. New Construction or Substantial Improvement. Check the applicable box. "Substantial Improvement" means any reconstruction, rehabilitation, addition, or other improvement of a building, the cost of which equals or exceeds 50 percent of the market value of the building before the start of construction of the improvement (or meets the community's more restrictive standards, if applicable). The term includes buildings that have incurred substantial damage, regardless of the actual repair work performed.

Item G9.a. As-built lowest floor elevation. Enter the elevation of the lowest floor (including basement) when the construction of the building is completed and a final inspection has been made to confirm that the building is built in accordance with the permit, the approved plans, and the community's floodplain management laws or ordinances. Indicate the elevation datum used.

Item G9.b. As-built lowest horizontal structural member. Enter the elevation measured at the bottom of the lowest horizontal structural member of the floor indicated by the selected Building Diagram (Item A7) or in the figure at the end of the instructions for Section C. Indicate the elevation datum used.

SECTION G – COMMUNITY INFORMATION (RECOMMENDED FOR COMMUNITY OFFICIAL COMPLETION) *(Continued)*

Item G10.a. BFE. Using the appropriate FIRM panel, FIS, or other data source, locate the property and enter the BFE (or base flood depth) of the building site. Indicate the elevation datum used.

Item G10.b. Community's minimum elevation or depth requirement. Enter the elevation (including freeboard above the BFE) to which the community requires the lowest floor or the lowest horizontal structural member to be elevated. Indicate the elevation datum used.

Item G11. Indicate Yes if a variance from the floodplain management regulations (Title 44 CFR § 60.6) has been issued for the building, attach the supporting documentation, and describe the attachment in the Comments area of this section. If no such variance has been issued, indicate No.

Enter your name, title, and telephone number, and the name of the community and add any comments. Sign and enter the date in the appropriate blanks.

SECTION H – BUILDING'S FIRST FLOOR HEIGHT INFORMATION FOR ALL ZONES(SURVEY NOT REQUIRED) (FOR INSURANCE PURPOSES ONLY)

In any flood zone the property owner, owner's authorized representative, or local floodplain management official may complete this certificate for rating purposes to determine the building's first floor height and identify the elevation of Machinery and Equipment (M&E) servicing the building. Sections A, B, and I must also be completed.

Note: If Sections C and/or E and H are all completed, then information in Section C will prevail for insurance purposes and for compliance.

Item H1.a. For Building Diagrams 1A, 1B, 3, and 5–9 shown on pages 17–19, enter in Item H1.a the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the selected Building Diagram, Item A7) above the LAG. Refer to the arrows on the Foundation Type Diagrams on page 16 that indicate which floor to use to determine the height for Item H1.a.

Item H1.b. For Building Diagrams 2A, 2B, 4, and 6–9 shown on pages 17–19, enter in Item H1.b the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the next higher floor or elevated floor (as indicated in the selected Building Diagram, Item A7) above the LAG. Refer to the arrows on the Foundation Type Diagrams on page 16 that indicate which floor to use to determine the height for Item H1.b.

Note: The LAG is the lowest point of the ground level immediately next to a building.

Item H2. Indicate "Yes" if ***all*** of the following M&E servicing the building, inside or outside the building, are elevated to at least the height of the location shown by the H2 arrow in the Foundation Type Diagrams on page 16: central air conditioner (including exterior compressor), furnace, heat pump (including exterior compressor), water heater, and elevator M&E. For contents-only insurance coverage, ***all*** of the following appliances will need to be elevated to at least the height of the location shown by the H2 arrow in the Foundation Type Diagrams below: clothes washers and dryers and food freezers.

Note: For both building and contents coverage, ***all*** of the M&E and appliances listed above must be elevated per the Foundation Type Diagrams on page 16 to be considered for the M&E mitigation discount.

Indicate "No" if any of the M&E listed above is not elevated to at least the height of the location shown by the H2 arrow in the Foundation Type Diagrams on page 16.

The diagrams on the following page illustrate the six NFIP Foundation Type Diagrams. Each foundation type corresponds with one or more of the eleven Building Diagrams shown at the end of this Elevation Certificate. The arrows on the diagrams indicate which floor to use to determine H1.a and H1.b. The arrows marked as H2 show the minimum elevation required to be eligible for the M&E mitigation discount.

SECTION I – PROPERTY OWNER (OR OWNER'S AUTHORIZED REPRESENTATIVE) CERTIFICATION

Complete as indicated. This section is provided for certification of measurements when completing Sections A, B, and H. If Section H is completed by a local floodplain management official, then complete Item G2.b and Section G instead of Section I. The address entered in this section must be the actual mailing address of the individual who provided the information on the certificate.

Check the box as indicated if including attachments (e.g., required photos) and describe in the Comments area.

Foundation Type Diagrams (for use in Section H):

Slab on Grade (Non-Elevated)

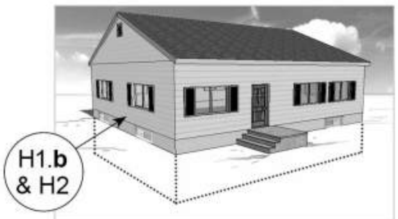
Corresponds to EC Diagrams 1A, 1B and 3

Note: If the building has more than one floor, the Machinery and Equipment should be on the second floor or higher.

Elevated without Enclosure on Posts, Piles, or Piers

Corresponds to EC Diagram 5

Basement (Non-Elevated)



Corresponds to EC Diagrams 2A, 2B and 4

Elevated with Enclosure on Posts, Piles, or Piers

Corresponds to EC Diagram 6

Crawlspace (Elevated, including Non-Elevated Sub-Grade Crawlspace)

Corresponds to EC Diagrams 8 and 9

Elevated with Enclosure Not on Posts, Piles, or Piers (Solid Foundation Walls)

Corresponds to EC Diagram 7

BUILDING DIAGRAMS

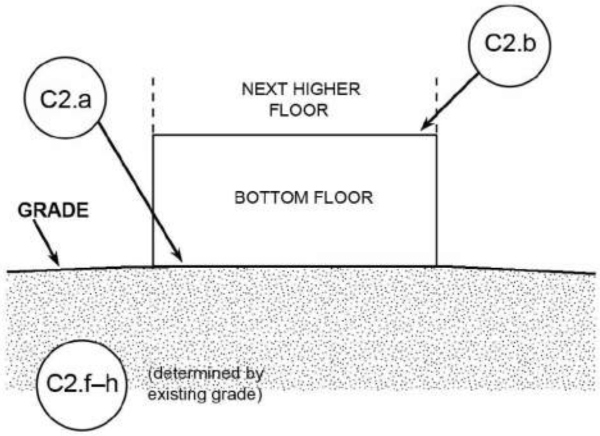
The following diagrams illustrate various types of buildings. Compare the features of the building being certified with the features shown in the diagrams and select the diagram most applicable. Enter the diagram number in Item A7, the square footage of crawlspace or enclosure(s) and the area of flood openings as indicated in Items A8.a–f, the square footage of attached garage and the area of flood openings as indicated in Items A9.a–f, and the elevations in Items C2.a–h.

In A, B, C, X and D zones, the floor elevation is taken at the top finished surface of the floor indicated; in V zones, areas seaward of the LiMWA, and in other areas regulated for coastal flooding hazards, the floor elevation is taken at the bottom of the lowest horizontal structural member (see figure at end of instructions for Section C).

<u>**DIAGRAM 1A**</u>:

All slab-on-grade single- and multiple-floor buildings (other than split-level) and high-rise buildings, either detached or row type (e.g., townhouses); with or without attached garage.

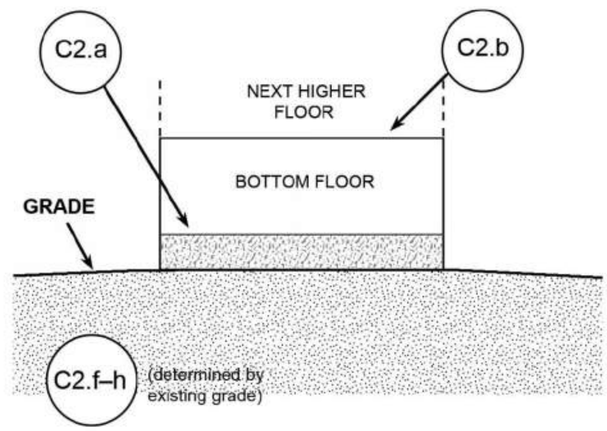
Distinguishing Feature – The bottom floor is at or above ground level (grade) on at least one side.*



<u>**DIAGRAM 1B**</u>:

All raised-slab-on-grade or slab-on-stem-wall-with-fill single- and multiple-floor buildings (other than split- level), either detached or row type (e.g., townhouses); with or without attached garage.

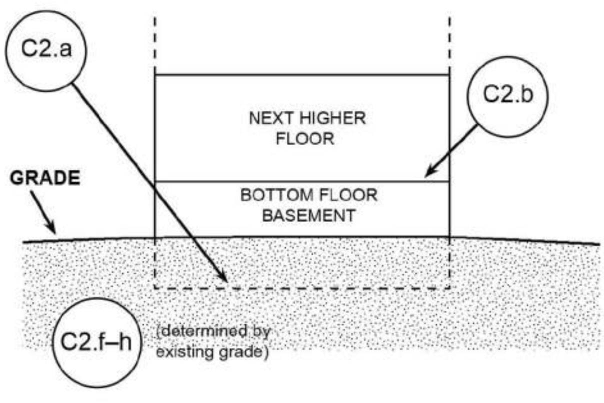
Distinguishing Feature – The bottom floor is at or above ground level (grade) on at least one side.*



<u>**DIAGRAM 2A**</u>:

All single- and multiple-floor buildings with basement (other than split-level) and high-rise buildings with basement, either detached or row type (e.g., townhouses); with or without attached garage.

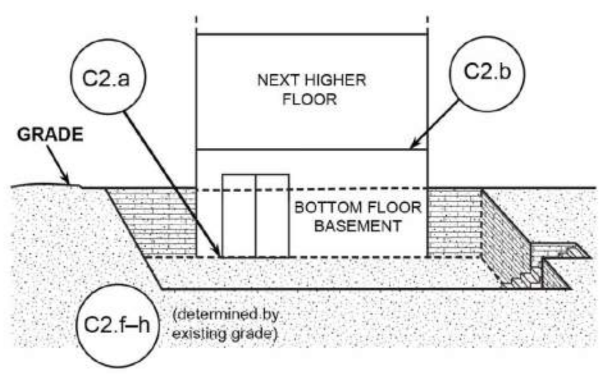
Distinguishing Feature – The bottom floor (basementor underground garage) is below ground level (grade) onall sides.*



<u>**DIAGRAM 2B**</u>:

All single- and multiple-floor buildings with basement (other than split-level) and high-rise buildings with basement, either detached or row type (e.g., townhouses); with or without attached garage.

Distinguishing Feature – The bottom floor (basement or underground garage) is below ground level (grade) on all sides; most of the height of the walls is below ground level on all sides; and the door and area of egress are also below ground level on all sides.*



* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc.

BUILDING DIAGRAMS

DIAGRAM 3:

All split-level buildings that are slab-on-grade, either detached or row type (e.g., townhouses); with or without attached garage.

Distinguishing Feature – The bottom floor (excluding garage) is at or above ground level (grade) on at least one side.*

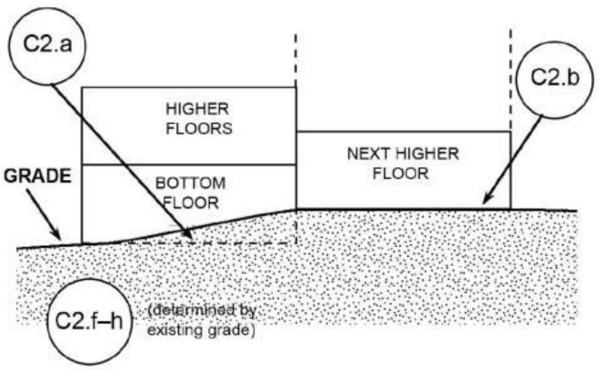


DIAGRAM 4:

All split-level buildings (other than slab-on-grade), either detached or row type (e.g., townhouses); with or without attached garage.

Distinguishing Feature – The bottom floor (basement or underground garage) is below ground level (grade) on all sides.*

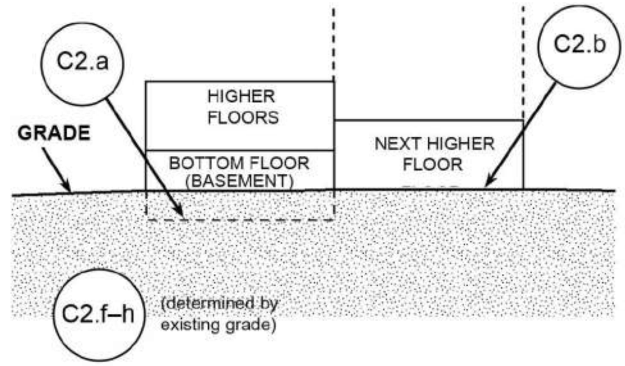


DIAGRAM 5:

All buildings elevated on piers, posts, piles, columns, or parallel shear walls. No obstructions below the elevated floor.

Distinguishing Feature – For all zones, the area below the elevated floor is open, with no obstruction to flow of floodwaters (open lattice work and/or insect screening is permissible).

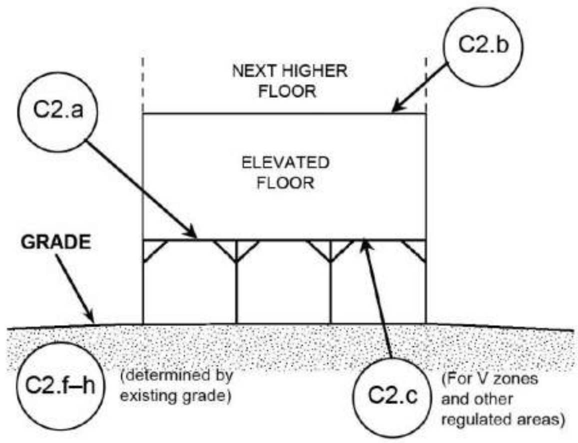
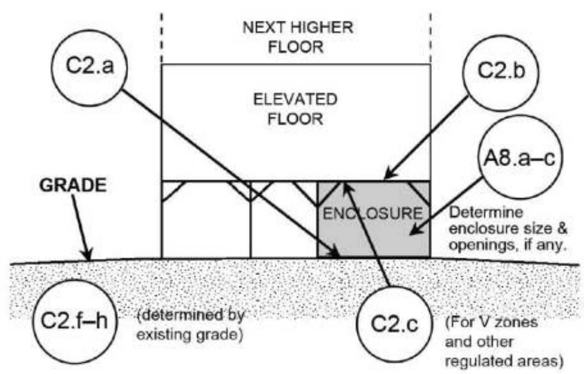


DIAGRAM 6:

All buildings elevated on piers, posts, piles, columns, or parallel shear walls with full or partial enclosure below the elevated floor.

Distinguishing Feature – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings** present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A - Property Information.



* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc.

** An "opening" is a permanent opening that allows for the free passage of water automatically in both directions without human intervention. Under the NFIP, a minimum of two openings is required for enclosures or crawlspaces. The openings shall provide a total net area of not less than one square inch for every square foot of area enclosed, excluding any bars, louvers, or other covers of the opening. Alternatively, an Individual Engineered Flood Openings Certification or an Evaluation Report issued by the ICC ES must be submitted to document that the design of the openings will allow for the automatic equalization of hydrostatic flood forces on exterior walls. A window, a door, or a garage door is not considered an opening; openings may be installed in doors. Openings shall be on at least two sides of the enclosed area. If a building has more than one enclosed area, each area must have openings to allow floodwater to directly enter. The bottom of the openings must be no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. For more guidance on openings, see NFIP Technical Bulletin 1.

BUILDING DIAGRAMS

DIAGRAM 7:

All buildings elevated on full-story foundation walls with a partially or fully enclosed area below the elevated floor. This includes walkout levels, where at least one side is at or above grade. The principal use of this building is located in the elevated floors of the building.

Distinguishing Feature – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings** present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A - Property Information.

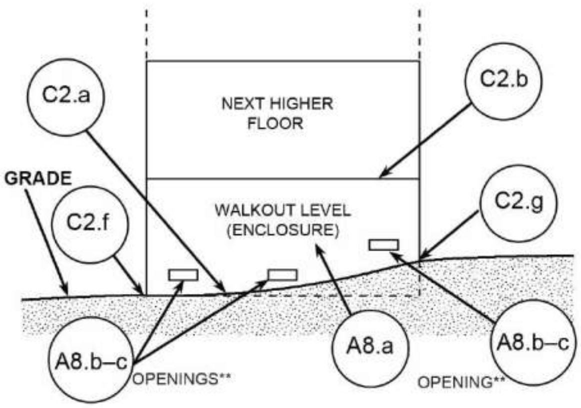


DIAGRAM 8:

All buildings elevated on a crawlspace with the floor of the crawlspace at or above grade on at least one side, with or without an attached garage.

Distinguishing Feature – For all zones, the area below the first floor is enclosed by solid or partial perimeter walls. In all A zones, the crawlspace is with or without openings** present in the walls of the crawlspace. Indicate information about crawlspace size and openings in Section A - Property Information. (If the distance from the crawlspace floor to the top of the next higher floor is more than 5 feet, use Diagram 7.)

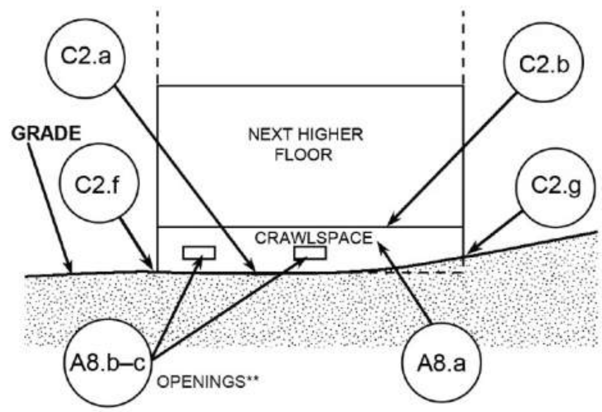
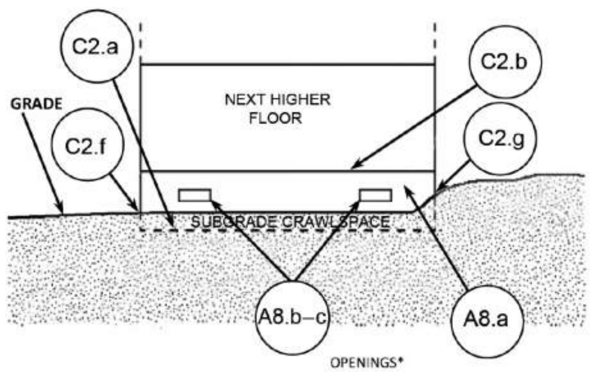


DIAGRAM 9:

All buildings (other than split-level) elevated on a sub-grade crawlspace, with or without attached garage.

Distinguishing Feature – The bottom (crawlspace) floor is below ground level (grade) on all sides.* (If the distance from the crawlspace floor to the top of the next higher floor is more than five feet, or the crawlspace floor is more than two feet below the grade [LAG] on all sides, use Diagram 2A or 2B.)



* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc.

** An "opening" is a permanent opening that allows for the free passage of water automatically in both directions without human intervention. Under the NFIP, a minimum of two openings is required for enclosures or crawlspaces. The openings shall provide a total net area of not less than one square inch for every square foot of area enclosed, excluding any bars, louvers, or other covers of the opening. Alternatively, an Individual Engineered Flood Openings Certification or an Evaluation Report issued by the ICC ES must be submitted to document that the design of the openings will allow for the automatic equalization of hydrostatic flood forces on exterior walls. A window, a door, or a garage door is not considered an opening; openings may be installed in doors. Openings shall be on at least two sides of the enclosed area. If a building has more than one enclosed area, each area must have openings to allow floodwater to directly enter. The bottom of the openings must be no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. For more guidance on openings, see NFIP Technical Bulletin 1.