

EASTSIDE AQUIFER RESTORATION INITIATIVE PROJECT

Initial Study/Mitigated Negative Declaration

Prepared for
Eastside Water District

October 2026



EASTSIDE AQUIFER RESTORATION INITIATIVE PROJECT

Initial Study/Mitigated Negative Declaration

Prepared for:
Eastside Water District
731 East Yosemite Avenue
Suite B #147
Merced, California 95340
Contact: Sarah Woolf
559.341.0174

October 2026

2600 Capitol Avenue
Suite 200
Sacramento, CA 95816
916.564.4500
esassoc.com



Bend	Pasadena	San Francisco
Irvine	Pensacola	San José
Los Angeles	Petaluma	Santa Barbara
Mobile	Portland	Sarasota
Oakland	Rancho Cucamonga	Seattle
Orlando	Sacramento	Tampa
Palm Beach County	San Diego	Thousand Oaks

CONTENTS

Initial Study/Mitigated Negative Declaration

	<u>Page</u>
Abbreviations	iii
Chapter 1.....	1-1
Introduction	1-1
1.1 Document Organization	1-2
1.2 Purpose of the Initial Study	1-2
1.3 Summary of Findings	1-2
Chapter 2.....	2-1
Project Description	2-1
2.1 Project Overview.....	2-1
2.2 Project Location and Existing Setting	2-2
2.3 Project Objectives	2-6
2.4 Project Components	2-6
2.4.1 TID Main Canal Turnout	2-8
2.4.2 Pump Station	2-8
2.4.3 Conveyance Pipeline	2-8
2.4.4 Regulating Basin	2-12
2.4.5 Turnouts from Conveyance Pipeline to Privately-Owned Agricultural Lands.....	2-12
2.4.6 Turnouts to Mustang Creek and Sand Creek	2-12
2.4.7 Re-Channelization of Mustang Creek through Agricultural Land	2-14
2.4.8 Culverts at Sand Creek Road Crossings	2-14
2.5 Construction Activities.....	2-14
2.6 Construction Equipment and Schedule.....	2-16
2.7 Project Operations and Maintenance.....	2-18
2.8 Responsible Agencies, Permits, and Approvals	2-18
2.9 Water Rights and Diversions	2-19
Chapter 3.....	3-1
Initial Study and Environmental Checklist.....	3-1
3.1 Environmental Factors Potentially Affected	3-3
3.2 Environmental Checklist	3-4
3.2.1 Aesthetics	3-4
3.2.2 Agriculture and Forestry Resources	3-7
3.2.3 Air Quality	3-10
3.2.4 Biological Resources	3-21
3.2.5 Cultural Resources	3-28
3.2.6 Energy	3-34
3.2.7 Geology and Soils	3-38
3.2.8 Greenhouse Gas Emissions	3-43

3.2.9	Hazards and Hazardous Materials	3-46
3.2.10	Hydrology and Water Quality	3-51
3.2.11	Land Use and Planning	3-57
3.2.12	Mineral Resources.....	3-59
3.2.13	Noise	3-60
3.2.14	Population and Housing	3-69
3.2.15	Public Services	3-70
3.2.16	Recreation	3-72
3.2.17	Transportation	3-73
3.2.18	Tribal Cultural Resources	3-76
3.2.19	Utilities and Service Systems	3-78
3.2.20	Wildfire	3-81
3.2.21	Mandatory Findings of Significance	3-84

Appendices

- A. CalEEMod Detailed Report
- B. Biological Constraints Report
- C. Aquatic Resources Delineation Report

Figures

Figure 2-1	Regional Location	2-4
Figure 2-2	Project Vicinity	2-5
Figure 2-3	Project Components	2-7
Figure 2-4	TID Main Canal Turnout and Pump Station Site Plan.....	2-9
Figure 2-5	Profile View of Main Canal Turnout	2-10
Figure 2-6	Pump Station Site and Surrounding Area	2-11
Figure 2-7	Typical Turnout Design.....	2-13
Figure 2-8	Mustang Creek Re-Channelization Cross Section.....	2-15
Figure 2-9	Construction Staging Area.....	2-17

Tables

Table 2.8-1	Regulatory Requirements, Permits, and Authorizations for Project Facilities	2-19
Table 3.2-1	SJVAPCD Rule 8021 Non-Administrative Measures and Notification Requirements Potentially Applicable to the Project	3-14
Table 3.2-2	County General Plan Policies Governing Air Quality	3-15
Table 3.2-3	Project Construction Emissions Summary	3-16
Table 3.2-4	Construction Vibration Damage Criteria	3-64
Table 3.2-5	Human Response to Transient Vibration	3-64
Table 3.2-6	County General Plan Policies Governing Noise	3-65
Table 3.2-7	Project Construction Noise Levels.....	3-66

ABBREVIATIONS

Abbreviation	Definition
AB	Assembly Bill
AEP	Association of Environmental Professionals
AF	acre-feet
AFY	acre-feet per year
ALUCP	Airport Land Use Compatibility Plan
APCO	Air Pollution Control Officer
BAAQMD	Bay Area Air Quality Management District
BAU	business-as-usual
BMPs	Best Management Practices
BRSA	biological resources study area
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal/OSHA	California Division of Occupational Safety and Health
CARB	California Air Resources Board
CCaIC	Central California Information Center
CCR	California Code of Regulations
CDC	California Department of Conservation
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH ₄	methane
CMU	concrete masonry unit
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO ₂	Carbon dioxide
COLE	coefficient of linear extensibility
DPM	diesel particulate matter
DTSC	Department of Toxic Substance Control
EARI	Eastside Aquifer Restoration Initiative
EPA	Environmental Protection Agency
ESA	Environmental Science Associates
ETSGSA	East Turlock Subbasin Groundwater Sustainability Agency

Abbreviation	Definition
EWD	Eastside Water District
FHSZ	Fire Hazard Severity Zone
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GAMAQI	Guidance for Assessing and Mitigating Air Quality Impacts
GHG	Greenhouse gas
GSP	Groundwater Sustainability Plan
HDPE	High Density Polyethylene Pipe
HFCs	hydrofluorocarbons
IPaC	Information for Planning and Consultation
IS	Initial Study
LRA	local responsibility area
MCFD	Merced County Fire Department
MCLs	maximum contaminant levels
MCSD	Merced County Sheriff's Department
MLD	Most Likely Descendent
MLRP	Multi-benefit Land Repurposing Program
MND	Mitigated Negative Declaration
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NO ₂	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
O ₃	Ozone
OPR	Office of Planning and Research
OSHA	Occupation Safety and Health Administration
PCE	tetrachlorethylene
PEIR	Program Environmental Impact Report
PFCs	perfluorocarbons
PM	particulate matter
PM ₁₀	Respirable particulate matter
PM _{2.5}	fine particulate matter
PMAs	projects and management actions
PPE	personal protective equipment
PPV	peak particle velocity
PRC	Public Resources Code
RCNM	Roadway Construction Noise Model
RMS	root mean square
ROG	reactive organic gases
RPS	Renewables Portfolio Standard
RWQCB	Regional Water Quality Control Board

Abbreviation	Definition
SCFPD	Stanislaus Consolidated Fire Protection District
SF ₆	sulfur hexafluoride
SGMA	Sustainable Groundwater Management Act
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLF	Sacred Lands File
SO ₂	sulfur dioxide
SRA	state responsibility area
SVP	Society of Vertebrate Paleontology
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	Toxic air contaminants
TDS	total dissolved solids
TID	Turlock Irrigation District
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
VMT	vehicle miles traveled
WDRs	Waste Discharge Requirements

Intentionally Blank

CHAPTER 1

Introduction

Groundwater overdraft and associated declines in groundwater levels have been occurring in the Turlock Subbasin for many years, and the need for groundwater recharge and water management projects to address these conditions has been formally identified through regional groundwater sustainability planning efforts. The use of available surface water supplies for groundwater recharge and in-lieu recharge has been encouraged by local and state planning documents as a means of improving groundwater conditions when water is available. The Turlock Subbasin Groundwater Sustainability Plan (GSP) (revised 2024), prepared in accordance with the Sustainable Groundwater Management Act (SGMA) describes existing groundwater conditions and identifies areas within the Subbasin where undesirable results related to groundwater overdraft, including declining groundwater levels and land subsidence, have the potential to occur. In response, the GSP establishes measurable objectives and minimum thresholds intended to avoid or reduce these undesirable results and to support long-term groundwater sustainability. The GSP also identifies multiple projects and management actions (PMAs) that propose structural and nonstructural measures to enhance regional water supply and meet the sustainability goals of the GSP. The PMAs were evaluated in 2023 Turlock Subbasin Groundwater Sustainability Plan Program Environmental Impact Report (PEIR) (State Clearinghouse [SCH] Number 2022010100).

To contribute to sustainable groundwater management in the Turlock Subbasin, in accordance with the GSP, the Eastside Water District (EWD), in partnership with the Turlock Irrigation District (TID) and the East Turlock Subbasin Groundwater Sustainability Agency (ETSGSA), has proposed the Eastside Aquifer Restoration Initiative (EARI) Project. The Project would build upon existing replenishment water delivery practices by expanding the ability to divert and convey surface water supplies when available for groundwater recharge and in-lieu recharge purposes within the eastern portion of the Subbasin and specifically to agricultural lands south of the TID Main Canal. The Project would involve construction of a new turnout on the TID Main Canal, a pump station, a conveyance pipeline, a regulating basin, associated farm turnouts off the pipeline, turnouts that discharge into Sand Creek and Mustang Creek, and the re-channelization of Mustang Creek to Mustang Lake.

Replenishment water delivered through the Project would be available for future use by on-farm projects constructed pursuant to ETSGSA's Groundwater Demand Reduction Plan to decrease groundwater use and increase groundwater recharge. Both private and ETSGSA-funded projects are anticipated to occur, are covered under the PEIR, and are not analyzed in this IS/MND as no specific project design plans have been developed at this time. See further discussion under Section 2.1.

1.1 Document Organization

Chapter 1, Introduction. This chapter provides an introduction to the Project, organization of this document, purpose of the Initial Study, and summary of findings.

Chapter 2, Project Description. This chapter describes the Project, including Project location, Project objectives, activities to be conducted under the Project, and potential permits and/or approvals that may be required for implementation of the Project.

Chapter 3, Initial Study Environmental Checklist. This chapter presents an analysis of implementation of the Project for the resource topics included in the California Environmental Quality Act (CEQA) Environmental Checklist (Appendix G of the CEQA Guidelines). For each resource topic question, the following are provided: (1) environmental setting, (2) discussion of the potential effects of implementing the Project, (3) finding of significance, and (4) any mitigation measures to be recommended for incorporation into the Project to reduce identified significant impacts to a less-than-significant level. This chapter lists the references used in preparation of this Initial Study for each resource topic.

Following completion of the required 30-day public comment period, and before approving the Project, the EWD will consider the Initial Study/Mitigated Negative Declaration (MND) together with any comments provided during the public comment period and will adopt the MND if, based on the whole of the record: (1) there is no substantial evidence that the Project will have a significant effect on the environment; and (2) that it represents EWD's independent judgment and analysis. EWD will also prepare and adopt a Mitigation Monitoring and Reporting Program as part of the approval process as required under Public Resources Code Section 21081.6(c) for mitigation measures identified in the MND.

1.2 Purpose of the Initial Study

This Initial Study was prepared in accordance with Public Resources Code Section 21000 et seq. CEQA and Title 14 of the California Code of Regulations Section 15000 et seq. (CEQA Guidelines). The Initial Study tiers from the 2023 PEIR pursuant to CEQA Guidelines Section 15162 and incorporates relevant information and mitigation where applicable. The purpose of this Initial Study is to (1) determine whether Project implementation would result in potentially significant or significant effects to the environment; and (2) identify mitigation measures as necessary, to eliminate the Project's potentially significant or significant Project effects or reduce them to a less-than-significant level.

1.3 Summary of Findings

Based on the analysis included in Chapter 3, implementation of the Project would result in:

- No impact on the following resource topics:
 - Agriculture and Forestry Resources
 - Land Use and Planning
 - Mineral Resources
 - Population and Housing
 - Recreation

- Less-than-significant impacts on the following resource topics:
 - Aesthetics
 - Air Quality
 - Energy
 - Greenhouse Gas Emissions
 - Hazards and Hazardous Materials
 - Hydrology and Water Quality
 - Public Services
 - Noise
 - Recreation
 - Transportation
 - Utilities and Service Systems
 - Wildfire
- Less-than-significant impacts with incorporation of mitigation measures on the following resource topics:
 - Biological Resources
 - Cultural Resources
 - Geology and Soils
 - Tribal Cultural Resources

This page intentionally left blank

CHAPTER 2

Project Description

2.1 Project Overview

In years when sufficient surface water is available, TID promotes direct and in-lieu groundwater recharge through the provision of “replenishment water” to irrigators outside of, but adjacent to TID’s irrigation service area. Historically, the bulk of the replenishment water sales have gone to irrigators east of TID’s irrigation service area as a substitute for groundwater pumping, providing in-lieu groundwater recharge.

The Eastside Aquifer Restoration Initiative Project (Project) would continue and expand upon these replenishment water deliveries through a partnership between EWD and TID. Under the proposed Project, TID would deliver water to lands within EWD and the ETSGSA when available upon approval by the TID Board of Directors. The Project would deliver water to currently developed agricultural lands outside the TID irrigation service area that has historically been solely dependent on groundwater for irrigation. Delivery of replenishment water would be limited to use on existing, currently developed agriculture and would not be used to develop new agricultural lands. Annual operation of the Project would be informed by the Tuolumne Reservoir Simulation model, which TID currently uses to estimate the volume of surface water available each year.

The Project would enable EWD to expand its ability to divert replenishment water, when available, by constructing a new turnout and pump station on the TID Main Canal. The new turnout and pump station would convey replenishment water to lands south of the TID Main Canal through a new pipeline. Up to twelve turnouts would be installed along the new pipeline, including ten grower turnouts, and a turnout on Sand Creek and a turnout on Mustang Creek and two grower turnouts will be installed within Mustang Creek. The pipeline would terminate at the Mustang Creek turnout and replenishment water would discharge into Mustang Creek and ultimately into Mustang Lake. The proposed Project was identified conceptually as Project 12 in the 2024 revised GSP and Project 9 in the 2023 PEIR.

Replenishment water conveyed to Mustang Lake would be available for other EWD and ETSGSA recharge projects not specifically addressed in this Initial Study, for example: direct recharge within Mustang Lake using drywells [Project 13 in the 2024 revised Turlock Subbasin GSP; Project 10 in the PEIR].

Additionally, replenishment water conveyed to the Sand Creek and Mustang Creek turnouts would be available to EWD and ETSGA for additional future recharge projects, which may include:

- Land repurposed for direct and incidental recharge through floodplain reconnection and flood flow dispersal under the Multi-benefit Land Repurposing Program [MLRP, GSP Management Action 1];

- Direct recharge through creekside basins and flood flow spreading projects that are part of the Mustang Creek Hydrology Restoration, Floodplain Reconnection, and Recharge Project [Project 17 in the 2024 revised Turlock Subbasin GSP; Projects 21 and 23 in the PEIR]; and
- Direct recharge through creekside basins and flood flow spreading projects that are part of the Sand Creek Watershed Flood Attenuation and Recharge Project [Project 18 in the 2024 revised Turlock Subbasin GSP; Projects 19, 21 and 23 in the PEIR].

Replenishment water could also be conveyed to adjacent properties to facilitate direct recharge and in-lieu recharge during the irrigation season. It is noted that while these private and ETSGSA-incentivized projects are not explicitly addressed in this IS/MND, they are included in the PEIR and will be addressed in site-specific environmental analyses and applicable resource agency permits when engineering design plans are developed. Additional site-specific and watershed-wide data will be collected as needed to support these future environmental analyses and permitting efforts.

Under the proposed Project, replenishment water deliveries would help maximize the utility of available water supplies to support groundwater sustainability in the Turlock Subbasin. During the irrigation season, replenishment water delivered through this Project would be used to offset demand for groundwater pumping and provide in-lieu recharge benefits to the Subbasin as well as direct recharge via recharge basins and incidental recharge (e.g., creek seepage). During the non-irrigation season, water delivered through this Project would be infiltrated by managed aquifer recharge (MAR), through recharge basins and incidental recharge, to provide direct recharge benefits to the Subbasin. In both cases, the Project is expected to benefit sustainability indicators of the GSP including groundwater levels, groundwater storage, land subsidence, and interconnected surface waters.¹

The proposed Project would contribute to sustainable groundwater management in the Turlock Subbasin by building upon and expanding existing collaboration between TID and EWD. Groundwater recharge resulting from the Project would occur in the eastern area of the Turlock Subbasin. Over the life of the proposed Project, the Project would be expected to provide an average of approximately 10,000 to 17,000 acre-feet per year (AFY) of in-lieu and direct recharge benefit during the irrigation season to the Turlock Subbasin, with approximately 4,000-8,000 AFY of direct recharge from replenishment during the non-irrigation season. These benefits would be expected to accrue when the TID Board of Directors allow deliveries to these areas.

2.2 Project Location and Existing Setting

The Project is situated within the boundaries of the East Turlock Subbasin GSA, which is south of the Tuolumne River, north of the Merced River and east of the San Joaquin River and within Stanislaus and Merced counties (**Figure 2-1**). The majority of the Project site is within the eastern portion of Stanislaus County, east of Montpellier Road (County Highway J9), south of the TID Main Canal and north of the Merced River, and some of the Project's southernmost features cross into Merced County (**Figure 2-2**).

¹ The GSP regulations define *interconnected surface water* as “surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted” (California Code of Regulations Title 23, Section 351[o]).

The center of the Project site is approximately 9 miles southeast of the city of Waterford and approximately 12.8 miles northeast of the city of Turlock.

The proposed Project is situated within Sections 3, 10, 15, 22, 26, 27, and 35 of Township 4 South, Range 12 East (Mount Diablo Base and Meridian) and Sections 3 and 10 of Township 5 South, Range 12 East, per the Public Land Survey System. It is generally bounded on the west by Hawkins Road (a county road) and on the east by a private farm road leading into Bledsoe Road (a county road), on the north by the TID Main Canal, and on the south by Mustang Lake.

The existing TID Main Canal is owned and operated by TID for delivery of water from Turlock Lake for agriculture irrigation. The approximate 0.15-acre site pump station site (Assessor Parcel Number [APN] 020-002-014) is located adjacent to the TID Main Canal on the south, outside the canal right of way. The site is privately-owned land, not in active agriculture use. The 10-acre site of the proposed regulating basin (APN 020-006-017) is currently fallowed agricultural land under private ownership. The site is planned for purchase by EWD.

Sand Creek and Mustang Creek are intermittent streams traversing agricultural lands in the Project area. The creeks are artificially altered channels that convey stormwater during rain events but are typically dry outside of the rainy season. Mustang Lake, originally constructed for flood control purposes, is owned by Merced County, maintained by EWD, and is regulated by the California Department of Water Resources Division of Safety of Dams. Water flowing down Mustang Creek ultimately discharges into the Highline Canal, which is owned and operated by TID for irrigation water delivery and flood water routing. Sand Creek is maintained by the Sand Creek Flood Control District, flows beneath the Highline Canal, and ultimately discharges onto agricultural land and into irrigation laterals and cross ditches that are owned and operated by TID, and operated for water delivery and flood water routing.

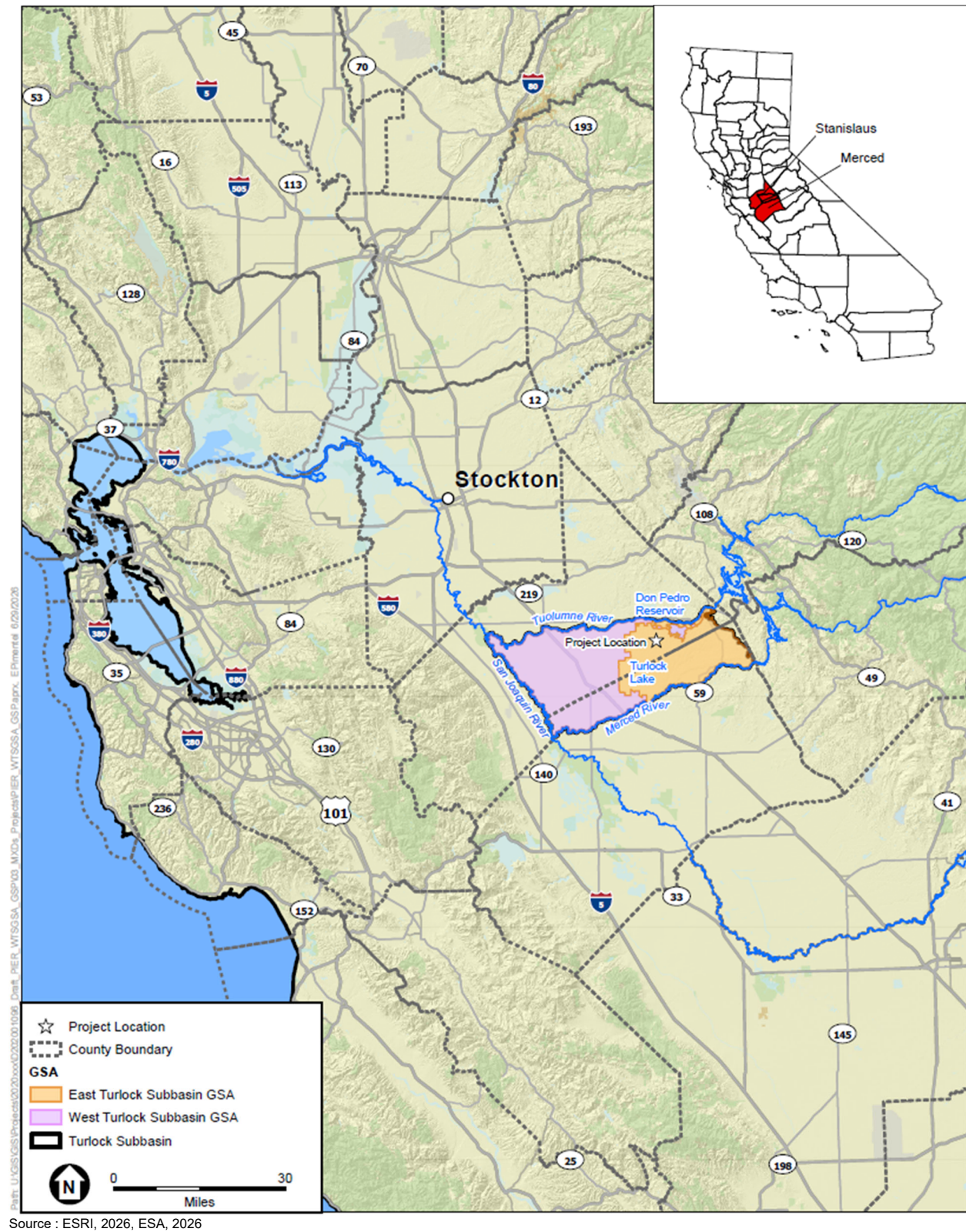
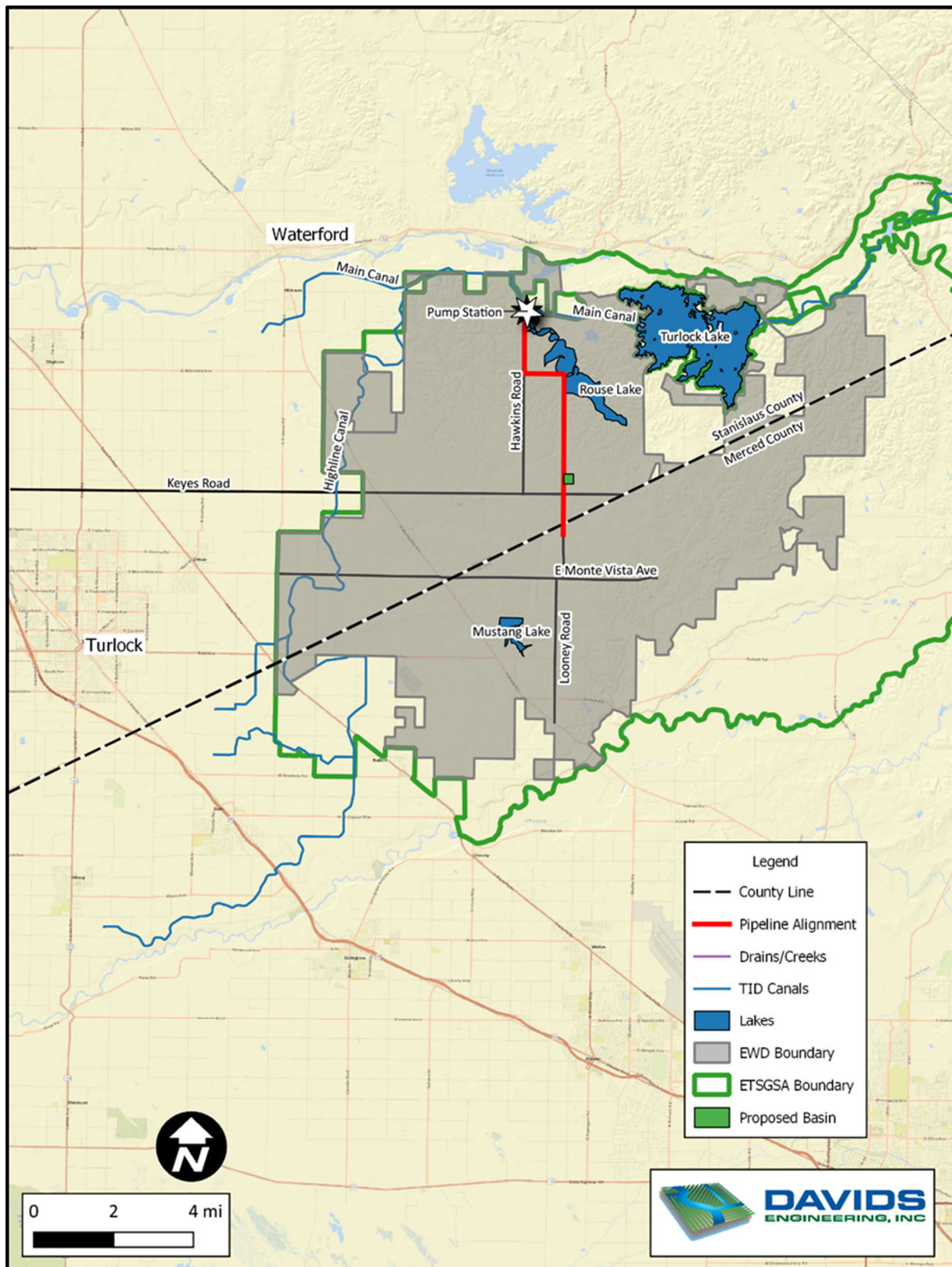


Figure 2-1
Regional Location



Source: Davids Engineering, 2026

Figure 2-2
Project Vicinity

2.3 Project Objectives

The objectives of the proposed Project are:

- Provide conveyance of TID replenishment water to agricultural areas south of the TID Main Canal for direct and in-lieu groundwater recharge
- Increase groundwater levels
- Increase groundwater storage
- Prevent subsidence by reducing lowering of groundwater levels
- Improve status of interconnected surface waters

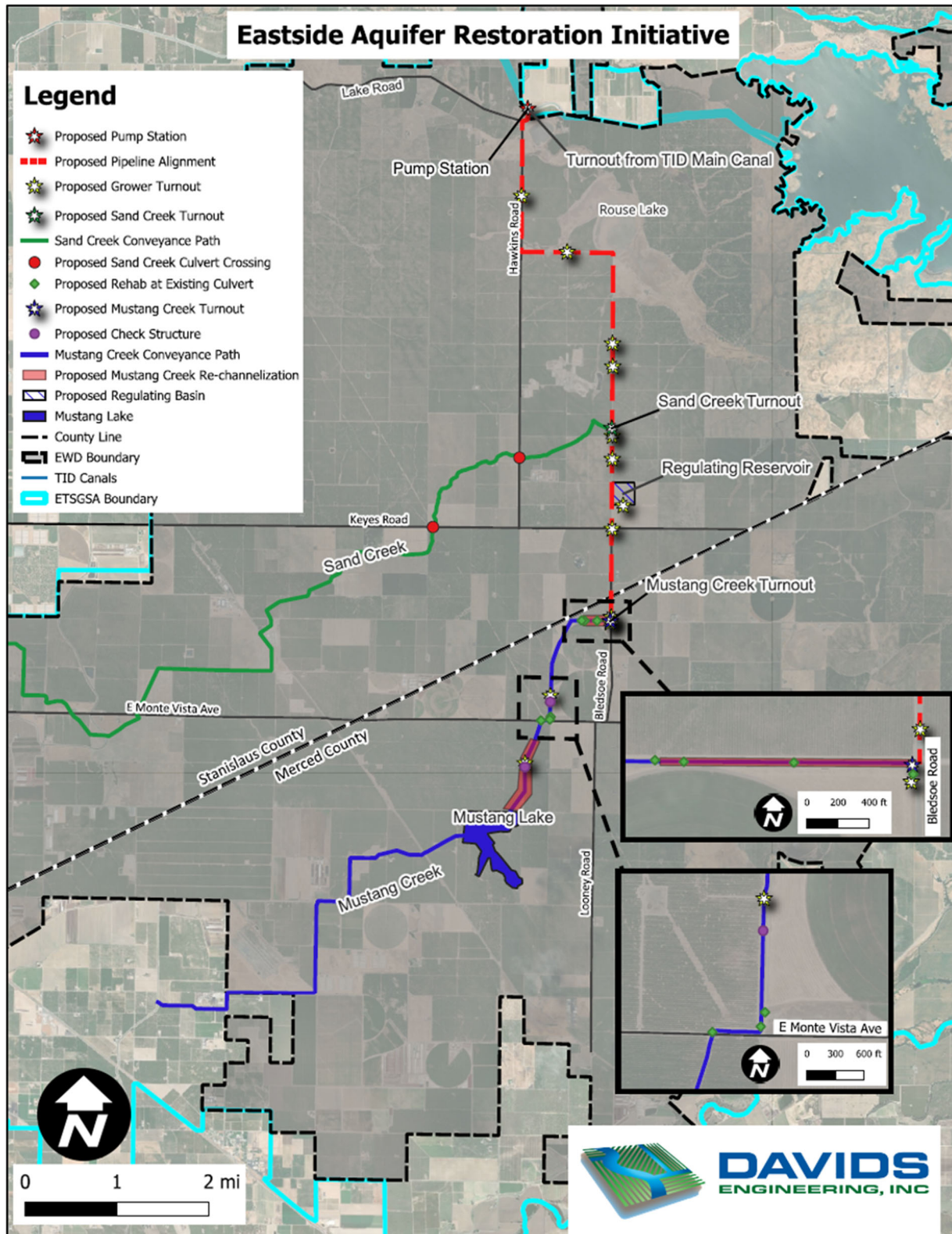
2.4 Project Components

The Project would distribute TID replenishment water to lands adjacent to the conveyance pipeline as well as to Sand Creek and Mustang Creek utilizing new turnouts and connections to both existing and new infrastructure. The pipeline connections and turnout infrastructure would be equipped with electromagnetic flow meters. In-lieu recharge and direct recharge would be accomplished through application to cropped areas and through discharge to both existing and future private recharge basins (to be constructed, owned and maintained by the landowners within EWD and not a part of the proposed Project).

The proposed Project components are listed below and shown in **Figure 2-3**:

- one turnout on the TID Main Canal
- new pump station at the new turnout on the TID Main Canal
- approximately 6.6 miles (34,900 linear feet) of 48-inch-diameter water conveyance pipeline extending southerly from the new pump station
- a regulating basin at the high point along the conveyance pipeline
- up to 12 twelve turnouts along the conveyance pipeline and Mustang Creek for adjacent landowners (growers) with connections to on-site irrigation systems for direct recharge and/or Flood MAR
- turnouts to Mustang Creek and Sand Creek
- re-channelization of Mustang Creek in two locations
- two new check structures within Mustang Creek for making deliveries along the creek
- rehabilitation of seven existing culverts flowing into Mustang Creek including the addition of flap gates to prevent reverse flows
- culverts for two road crossings of Sand Creek

Detailed descriptions of the Project components are provided in the following subsections.



Source: Davids Engineering, 2026

Figure 2-3
Project Components

2.4.1 TID Main Canal Turnout

The TID Main Canal flows out of Turlock Lake and is situated within an existing right of way approximately 200 feet in width. The canal itself is approximately 110 feet wide and 11 feet deep at the proposed turnout location and has a capacity of approximately 2,100 cubic feet per second (cfs) at this location. The Project would be designed with a pumped flow capacity of 50 cfs from the turnout.

Figure 2-4 shows the proposed turnout. **Figure 2-5** shows a profile view of the proposed turnout.

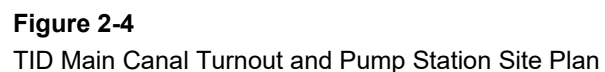
2.4.2 Pump Station

Water from the TID Main Canal turnout would be conveyed to the proposed pump station via a 32-foot-long 60-inch-diameter rubber gasketed reinforced concrete pipe. As shown in Figure 2-4, the pump station would be located approximately 32 feet southwest of the TID Main Canal, outside of the TID right of way, and would include a reinforced concrete wet well (sump), two 450 horsepower (hp) pumps and one 250 hp jockey pump. The pumps would be situated on a concrete pad of approximately 60 feet by 20 feet and would be driven by electric motors. A control structure would be situated approximately 40 feet to the west of the sump and would consist of a concrete masonry unit (CMU) structure with dimensions of 15 feet by 15 feet and height of 10 to 12 feet (one-story). The pump station would have a capacity of up to 50 cubic feet per second or 100 acre-feet (AF) per day.

Electrical power to the pump station would be provided by TID and would require installation of new connection from Lake Road, an electrical pole on a concrete pedestal and a new transformer situated on an 8-foot by 8-foot concrete slab. The pump station facilities would be surrounded by security fencing. Storm water drainage would be collected in three drain inlets and conveyed through a below ground storm drain (12-inch and 24-inch rubber gasketed reinforced concrete pipe) that would discharge into an existing sump that is used to pump stormwater into Rouse Lake. Access to the pump station site would be provided at two 20-foot gated entrances, one located along the southeastern side of the pump station and one along the TID canal right of way, just west of the wet well. A view of the pump station site and adjacent surrounding area is shown in **Figure 2-6**.

2.4.3 Conveyance Pipeline

The conveyance pipeline would extend from the pump station at the TID Main Canal to the proposed Mustang Creek turnout for a total length of approximately 34,900 feet (as shown previously in Figure 2-3). The pipeline is expected to be 48-inch-diameter High Density Polyethylene Pipe (HDPE). Air vents and other pipeline appurtenances would be installed as dictated by topography and site features using engineering standard practices of design. From the TID Main Canal, the pipeline would traverse southerly following Hawkins Road for a distance of approximately 1.5 miles, then easterly along the northern boundary of an existing orchard for a distance of approximately 1 mile. From there, the pipeline would continue southerly within a private farm road for a distance of approximately 2.5 miles where it would discharge into a proposed regulating basin (described below). The downstream segment of the pipeline would flow out of the regulating basin and continue southerly in the farm road and then into Bledsoe Road for approximately 1.5 miles to a termination point at the proposed turnout to Mustang Creek, approximately 1 mile south of Keyes Road and Bledsoe Road intersection. At the Mustang Creek turnout, the replenishment water would discharge into Mustang Creek for delivery to Mustang Lake.



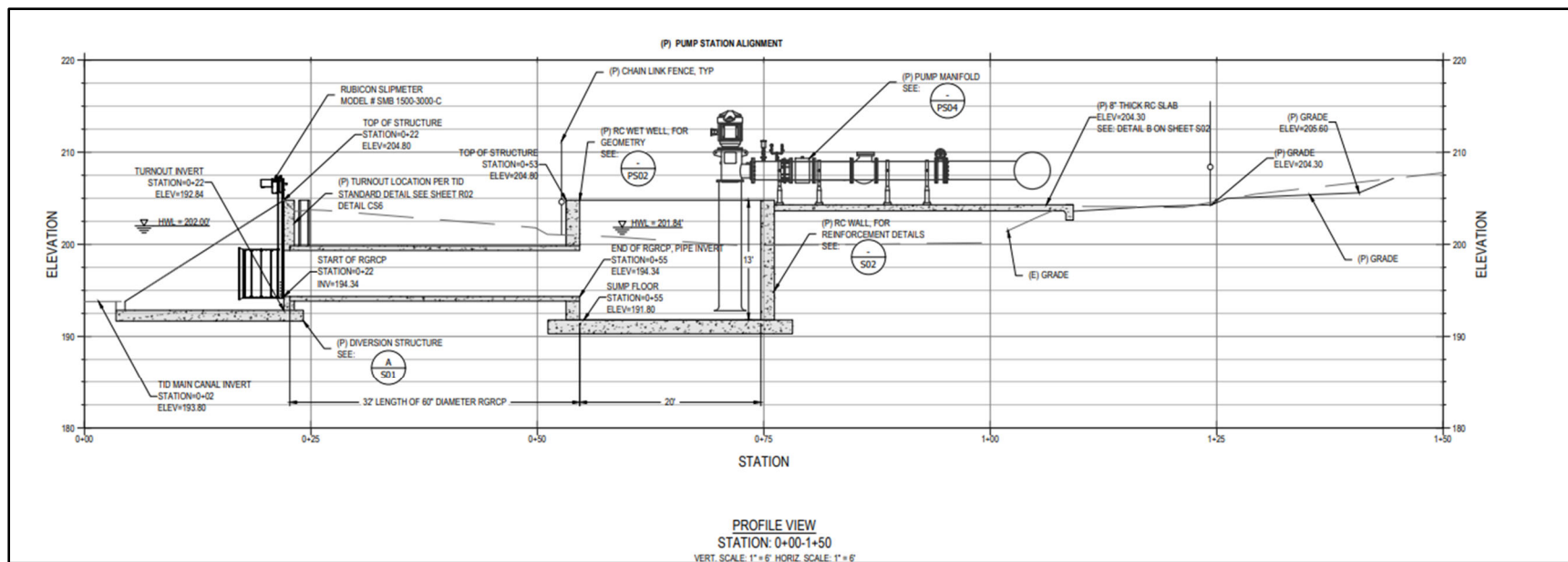


Figure 2-5
Profile View of Main Canal Turnout



Figure 2-6
Pump Station Site and Surrounding Area

2.4.4 Regulating Basin

A 39-acre-foot regulating basin would be installed at the high point of the conveyance system to improve delivery flexibility and mitigate transient flow conditions. The unlined basin would have dimensions of approximately 750 feet by 450 feet and designed for a 5.6-acre wetted area and 2 feet of freeboard. Total basin size would be approximately 7.5 acres and contain 3:1 (horizontal:vertical) slopes. The basin depth would vary based on existing topographic elevations at the site, with some areas extending to depths of 9 feet below existing grade, and other areas would be 4 feet above the existing adjacent grade. A 20-foot-wide embankment road would encircle the top of the basin, with access provided via a 20-foot-wide access ramp at 10:1 slope. The embankment road and access ramp would be topped with Class II aggregate base rock. Access would be controlled with gates.

2.4.5 Turnouts from Conveyance Pipeline to Privately-Owned Agricultural Lands

As shown in Figure 2-3, the project includes up to 10 turnouts for local landowners (growers) off the conveyance pipeline. The locations of these private grower turnouts off the conveyance pipeline are approximate but would, in general be connected to on-farm irrigation systems through the combined use of existing and new buried pipelines. Each grower turnout would consist of a tee and a length of capped pipe, a butterfly valve and magnetic flow meter for use by EWD and two air vents. The grower turnouts would extend to the edge of the proposed pipeline easements where private landowners would install a pipeline to their existing irrigation systems, private recharge basins or for MAR application. The portion of landowner turnouts constructed as a part of this Project would be made of either 18-inch or 14-inch HDPE pipe. Landowners would have the option to reduce the size of the pipe used to tie into their private irrigation systems. Most private conveyance lines are expected to be comprised of 12-inch to 18-inch PVC pipe. Landowners would be responsible for installing a valve and electromagnetic flowmeter when connecting to the turnouts, and connections would require approval from EWD prior to construction. A standard turnout design is shown in **Figure 2-7**.

2.4.6 Turnouts to Mustang Creek and Sand Creek

The Project also includes measured turnouts which would discharge into Sand Creek and Mustang Creek, as shown in Figure 2-3. Replenishment water from the turnouts would be discharged into the existing creek beds and allowed to flow downstream. Seepage along the creeks would provide incidental groundwater recharge. In addition, private landowners would have the opportunity to divert replenishment water into existing and future recharge basins constructed adjacent to the creeks, or for MAR. Two proposed grower turnouts off Mustang Creek are shown in Figure 2-3. Water diverted into recharge basins could be allowed to recharge directly through the basin, and could also be applied to growers' fields for in-lieu recharge or MAR. As discussed in Section 2.1, construction of private recharge basins, irrigation infrastructure, and MAR infrastructure is not a part of the Project but is included in the PEIR, and would undergo additional environmental review and permitting when engineering design plans are developed and prior to construction. Additionally, potential future grower turnouts along Sand Creek as well as potential re-channelization of any segments of Sand Creek are not specifically addressed in this Initial Study/MND. Any such future work would undergo separate environmental review and permitting at the time the work is proposed and design details are available.

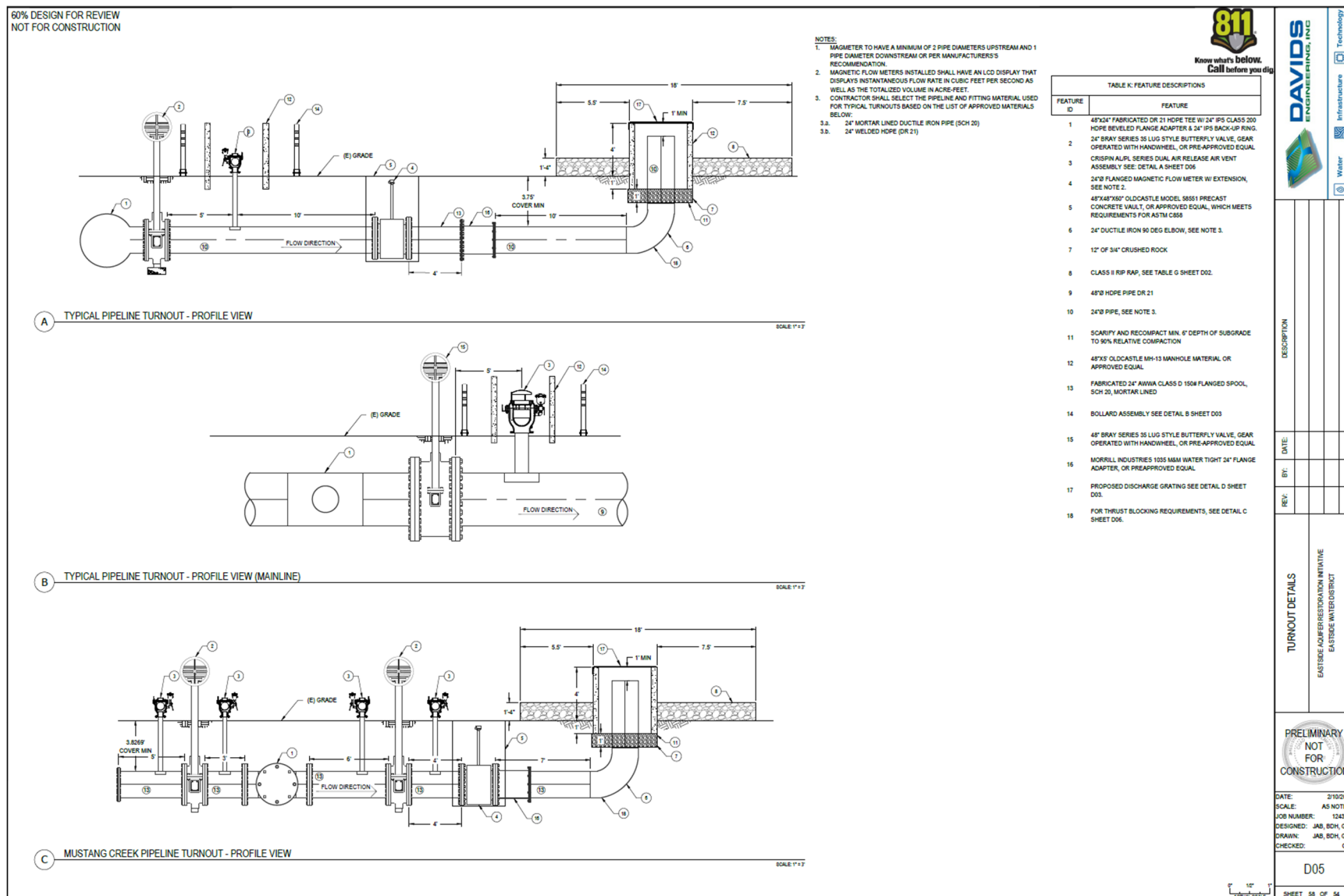


Figure 2-7
Typical Turnout Design

2.4.7 Re-Channelization of Mustang Creek through Agricultural Land

The Project includes re-channelization of two segments of Mustang Creek to allow for continued conveyance of replenishment water to Mustang Lake. The first section of re-channelization would begin at the Mustang Creek turnout located west of Bledsoe Road (see Figure 2-3) and would continue west for approximately 0.3 miles. The second section of re-channelization would begin south of E. Monte Vista Avenue and extend for approximately 1 mile through existing agricultural areas for conveyance to Mustang Lake. Re-channelization would require excavation of soil and the grading of side slopes at 2:1 (horizontal:vertical). Class II rip-rap would be placed around the entrance and exit of the culvert road crossings to prevent erosion of the creek. **Figure 2-8** shows a typical cross section of the re-channelized creek.

Two concrete check and turnout structures would be constructed to allow for deliveries to growers located on Mustang Creek. These structures would use removable weir boards to help regulate and direct creek flows for delivery to participating landowners during the irrigation season. During the flood season, the boards would be removed so flows can pass through the structures without obstruction.

Additionally, the Project would rehabilitate seven existing culverts that discharge to Mustang Creek to control storm run-off from adjacent watersheds. Flap gates would be installed on the culverts to prevent Project-delivered water from flowing backward into the drainage system while allowing stormwater to enter the creek without flooding nearby properties. Replenishment water conveyed through Mustang Creek would outflow naturally into Mustang Lake; no outfall structure would be needed.

2.4.8 Culverts at Sand Creek Road Crossings

Conveyance of replenishment water in Sand Creek requires the crossing of Hawkins Road and E. Keyes Road via new culverts. These proposed culverts would consist of 40-foot-long, 48-inch-diameter reinforced concrete pipes (one pipe per crossing) and would have a minimum 20-foot drivable width. The new road culverts would help alleviate flooding of Hawkins Road, which typically occurs during and shortly after major rain events at this location.

2.5 Construction Activities

The conveyance pipeline would be installed by digging a trench within Hawkins Road, Bledsoe Road and existing farm roads, and placing pipe within the trench to the design grades and elevations. The trench would have a minimum dimension based on the pipeline's 48-inch diameter as follows: the trench width would be 2 feet wider than the diameter and the trench depth would be 3 to 5 feet deeper than the pipe diameter. Installation within Hawkins Road and Bledsoe Road would require final backfill layers consisting of Class II aggregate base and asphalt concrete pavement. Soils excavated for construction of the conveyance pipeline would be reused by the Project as pipeline backfill and earthwork would be balanced. Any excess soil from trench excavation would be placed within the farm roads and graded to accommodate existing road drainage.

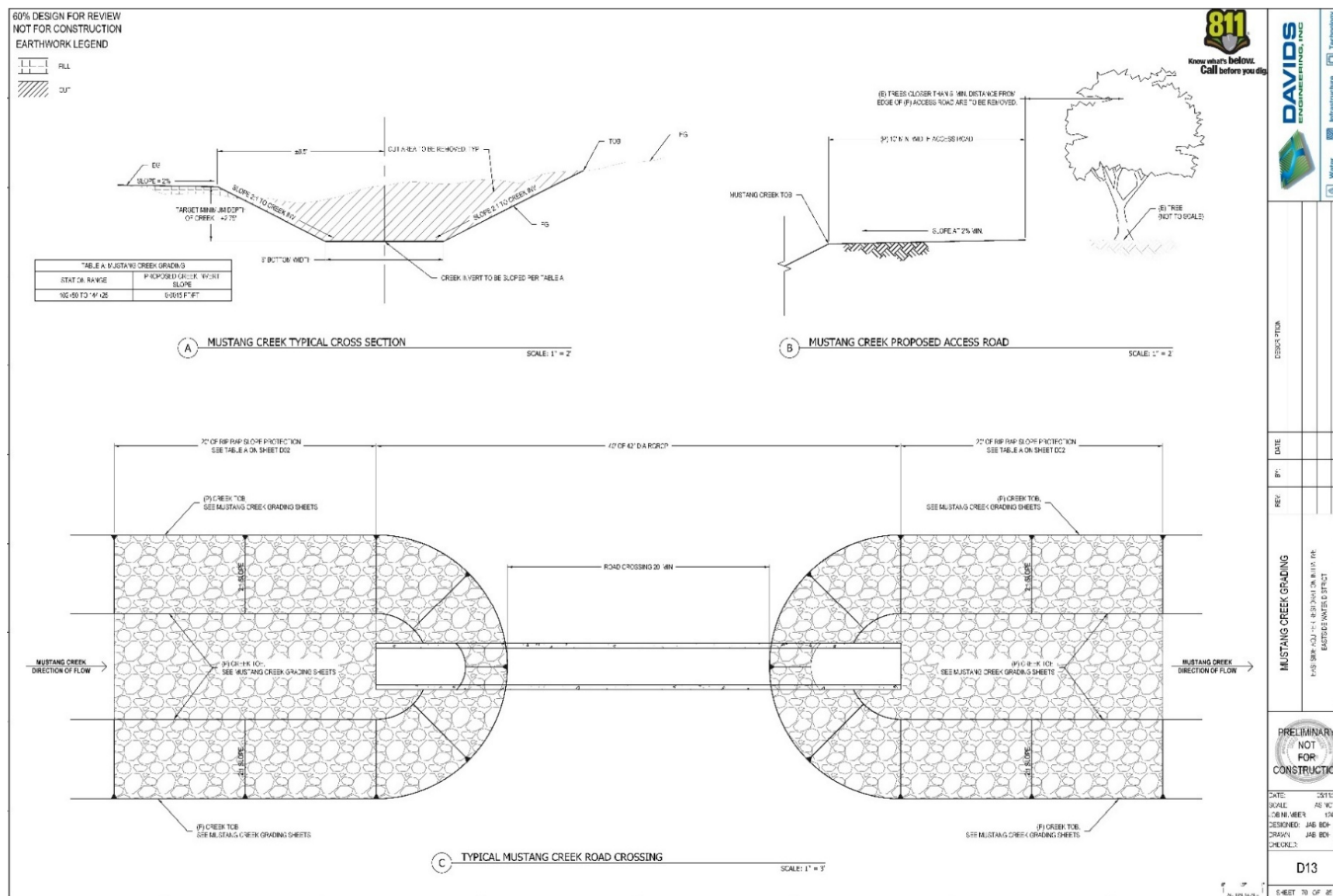


Figure 2-8
Mustang Creek Re-Channelization Cross Section

Grading of the regulating basin would require approximately 33,580 cubic yards of cut and approximately 24,500 cubic yards of fill. Excess cut material (approximately 9,080 cubic yards) would be stockpiled adjacent to the basin for future use by EWD.

To allow for adequate conveyance of flow in Mustang Creek, the Project would require re-channelization of portions of the creek. Re-channelization of Mustang Creek through agricultural lands would require gently-sloped re-grading of the channel bed and 2:1 sloped channel banks. Grading would result in approximately 13,650 cubic yards of cut and approximately 125 cubic yards of fill. Excess cut material (approximately 13,525 cubic yards) would be excavated and hauled to a construction staging area on a nearby vacant parcel of land owned by Merced County (see Figure 2-9). The existing agricultural land that would be used for the re-channelization is not actively farmed, although up to 20 adjacent orchard trees may need to be removed prior to construction. All re-channelization work would be conducted in accordance with applicable state and federal permits.

As a part of the re-channelization of Mustang Creek, seven existing culverts which drain into the Creek would be rehabilitated and fitted with flap gates, and two new concrete check structures would be constructed within the creek (as shown in Figure 2-3). The flap gates would allow storm flows to drain into the creek as intended while also preventing any reverse flows from exiting the creek prematurely. The concrete check structures would be used to aid in delivering water to landowners along Mustang Creek and would stand between 5 and 6 feet tall and approximately 8 feet wide. These structures would be cast in place reinforced concrete while the turnouts would be precast reinforced concrete.

The primary construction staging area is a 2.5-acre vacant parcel owned by Merced County, located adjacent to the Mustang Creek re-channelization area, north of Mustang Lake, as shown in **Figure 2-9**. Additionally, staging for construction of the pump station would take place within the boundaries of the pump station site, and staging for construction of the regulating basin would take place within southern portion of the regulating basin site.

2.6 Construction Equipment and Schedule

Construction activities for the proposed Project would last approximately 12 months continuously utilizing 7 AM – 6 PM working hours at 5 days per week. A peak construction crew would consist of 40 workers max, following the approximate assignments: 15 pipeline earthwork crew, 12 earthwork crew, 9 concrete crew, and 4 inspection crew. The proposed Project would use the following equipment:

- Excavators
- Road grader/blade
- Sheepsfoot compactors
- Water Trucks
- Skiploaders
- Concrete Trucks
- Earthwork scrapers
- Backhoes
- Smooth drum rollers
- Loaders
- Haul Trucks



Figure 2-9
Construction Staging Area

2.7 Project Operations and Maintenance

EWD would operate and maintain the pump station and would schedule diversions with TID when excess flows are available. The flow meters at the pump station would monitor flows. These flow meters would be electromagnetic (mag meters) and would require minimal maintenance. The pump station would require bi-weekly maintenance checks when operating and minor amounts of lubricating oils and grease may be stored on site for maintenance of pump station equipment.

EWD would operate the regulating basin during periods of flow diversions to provide operational flexibility of the conveyance system under variable flow conditions. Maintenance of the basin would likely require disking on an annual or biannual basis to control weed growth. Some sediment removal could be required over time, however TID replenishment water originating from Turlock Lake does not contain high solids that would require routine sediment removal.

EWD would operate the check structures and grower turnouts during periods of flow diversions. EWD staff would add and remove weir boards to the Project's check structures as necessary to accommodate deliveries along Mustang Creek and would operate butterfly valves located at each grower turnout to allow for the delivery of Project water to growers participating in the Project. The check structures and grower turnouts would require minimal maintenance.

2.8 Responsible Agencies, Permits, and Approvals

Table 2.8-1 summarizes the permits and/or approvals that may be required before construction of the proposed Project.

**TABLE 2.8-1
REGULATORY REQUIREMENTS, PERMITS, AND AUTHORIZATIONS FOR PROJECT FACILITIES**

Jurisdiction	Agency/Entity	Type of Approval
Federal Agencies	United States Army Corps of Engineers (USACE)	Clean Water Act Section 404 Permit
State Agencies	Central Valley Regional Water Quality Control Board (RWQCB)	Clean Water Act Section 401 Water Quality Certification/ Waste Discharge Requirements (WDRs) National Pollutant Discharge Elimination System Permit (NPDES) General Permit for Stormwater Discharge Associated with Construction
	California Department of Fish and Wildlife (CDFW)	California Department of Fish and Game Code Section 1602 Lake and Streambed Alteration Agreement
	California Division of Occupational Safety and Health (Cal/OSHA)	Construction or Excavation Permit
Local Agencies	Stanislaus County	Encroachment Permit Approval of traffic control plan Approval of clearing and grubbing plan
	Merced County	Encroachment Permit Approval of traffic control plan Approval of clearing and grubbing plan Agreement for use of staging area on County land
	Turlock Irrigation District (TID)	Approval of project design plans and power service connection Approval of replenishment water releases from TID Main Canal
	East Turlock Subbasin Groundwater Sustainability Agency (ETSGSA)	Approval of requests for funding in accordance with the Memorandum of Understanding between EWD and ETSGSA dated November 20, 2026
Other	Private Landowners	Easements for pipeline facilities and creek conveyance

2.9 Water Rights and Diversions

Water would be diverted for the proposed Project by TID through conservation and/or existing water rights.

This page intentionally left blank

CHAPTER 3

Initial Study and Environmental Checklist

1. **Project Title:** Eastside Aquifer Restoration Initiative Project
2. **Lead Agency Name and Address:** Eastside Water District
3. **Contact Person and Phone Number:** Sarah Woolf (559) 341-0174
4. **Project Location:** Stanislaus and Merced Counties, California
5. **Project Sponsor's Name and Address:** Eastside Water District
6. **General Plan Designation(s):** AE (Agricultural Exclusive), OS (Open Space) – Stanislaus County portion, A (Agricultural) – Merced County portion
7. **Zoning:** ARE-40 (Agricultural, Rural, Exclusive [40 acre] District), OS (Open Space) – Stanislaus County portion, A-2 (Exclusive Agricultural) – Merced County portion

8. Description of Project:

The Eastside Aquifer Restoration Initiative (EARI) Project is a groundwater sustainability project proposed by the Eastside Water District (EWD), in partnership with the Turlock Irrigation District (TID), to convey replenishment water to agricultural areas south of the TID Main Canal and enhance in-lieu and direct groundwater recharge within the eastern portion of the Turlock Subbasin. The Project involves construction and operation of a new turnout on the TID Main Canal, a pump station, conveyance pipeline, regulating basin, turnouts along the pipeline to deliver replenishment water to agricultural lands as well as Sand Creek and Mustang Creek when available. Replenishment water would be used to offset groundwater pumping during the irrigation season and to facilitate direct groundwater recharge during the non-irrigation season. The Project also includes re-channelization of a portion of Mustang Creek in two locations to continue the conveyance of replenishment water to Mustang Lake.

9. Surrounding Land Uses and Setting

The Project area is located primarily within rural agricultural lands in eastern Stanislaus County, with limited components extending into Merced County, and is characterized by active farming uses, irrigation infrastructure, and intermittent creek corridors.

10. Other Public Agencies whose Approval is Required

U.S. Army Corps of Engineers, Central Valley Regional Water Quality Control Board, California Department of Fish and Wildlife, Stanislaus County, Merced County, Turlock Irrigation District

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

In accordance with Public Resources Code Section 21080.3.1, notification letters were sent to tribal representatives of California Native American tribes that have requested to be notified of projects within the EWD service area. Tribal representatives were advised of the Project and invited to request formal consultation with EWD regarding the Project within 30 days of receiving the notification letters. Notification letters were sent to representatives of the following tribes on July 20, 2026:

- Amah Mutsun Tribal Band
- Northern Valley Yokut/Ohlone Tribe
- Southern Sierra Miwuk Nation
- Tule River Indian Tribe
- Wuksachi Indian Tribe/Eshom Valley Band

No tribal representatives requested consultation. For further discussion, see Section 3.2, *Environmental Checklist – Tribal Cultural Resources*.

3.1 Environmental Factors Potentially Affected

The environmental factors checked below include impacts that are “Less than Significant with Mitigation Incorporated.” There are no environmental factors that have an impact that is identified as a “Potentially Significant Impact” as all potential significant impacts can be reduced to less than significant with the incorporation of mitigation measures.

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

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial study:

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

Sarah Woolf

Name



Signature

General Manager

Title

October 13, 2026

Date

3.2 Environmental Checklist

3.2.1 Aesthetics

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than- Significant Impact</i>	<i>No Impact</i>
I. AESTHETICS — Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In 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?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area?	☐	☐	☒	☐

Environmental Setting

The geographic scope for the analysis of impacts on aesthetics and visual resources reflects public views of the Project components. Generally, the study area for aesthetics and scenic resources encompasses public locations from which the public typically would view a component of the Project.

U.S. Census Bureau Urban Area maps were reviewed to determine which of the proposed project components would be located in urbanized areas, as defined in CEQA Guidelines Section 15387 (U.S. Census Bureau 2023). The results of this review indicate that the Project components are within an unurbanized area. Therefore, consistent with the CEQA Guidelines Appendix G Checklist and Criterion c, the impacts to visual quality and character are based on the proposed project's effects to the visual characteristics of line, form, color, and texture of the landscape.

Impact Analysis

- a) **No Impact.** A substantial adverse effect on a scenic vista would typically occur if the Project would result in permanent changes to the visual landscape as viewed from a scenic vista. No designated scenic vistas or notable geographic features have been identified in the Stanislaus General Plan (2016) and Merced County General Plan (2011) that are within the Project vicinity or in areas from which the Project site and Project components would be visible. Additionally, there are no recreational trails or parks that offer unique scenic value from which the Project site is visible. Therefore, the Project would have no impact on a scenic vistas.
- b) **No Impact.** The nearest Designated State Scenic Highway is Interstate 5 and State Route 152, which is located more than 30 miles west from the Project components (Caltrans 2018). At that distance, the reduced visual scale of the Project, combined with potential landscape obstructions and the speed of travel along the highway, would preclude views of Project construction or built

components. Therefore, the Project would not impact scenic resources within a State Scenic Highway and there would be no impact under this criterion.

- c) **Less-than-Significant Impact.** Scenic resources generally include scenic landscapes, scenic highways, or scenic areas, as well as historic structures, trees, or other resources that contribute to the scenic values of an area. There are no designated scenic resources in the Stanislaus County General Plan, and recreational trails and parks that offer scenic value are located over 3 miles away from Project components (Stanislaus County 2016). Merced County General Plan identifies scenic vistas in the county such as the Coastal and Sierra Nevada mountain ranges, and the Los Banos Creek, Merced, San Joaquin, and Bear Creek river corridors (Merced County 2011). However, these vistas are located over 20 miles away from Project components.

Motorists traveling along Lake Road, Hawkins Road and Bledsoe Road and along unnamed agricultural access roads in unincorporated Stanislaus and Merced counties may experience views of Project construction activities including mechanical equipment and ground disturbances. While these visual impacts would be most noticeable to motorists, impacts would be temporary and short-term in nature as these viewers continue to move past construction activities. Upon completion of construction, any remaining equipment would be removed and staging areas would be restored to their original condition. Therefore, impacts on scenic quality due to Project construction would be less than significant.

Once constructed, only the Project's above-ground features would be visible. These include a pump station with three pumps, electrical pole, and small concrete block wall control building located on the south side of the TID Main Canal, as well as a regulating basin with side slopes of up to 5 feet, located along a farm road east of Hawkins Road. Because the Project is located in a non-urbanized area, the relevant consideration is whether the Project would substantially degrade the existing visual character or quality of public views of the site and its surroundings. The above ground components would not be visually dominant features in the agricultural landscape nor inconsistent with the general visual character and topography of the surrounding area and would not be viewed by a substantial number of individuals. Public views from nearby roads would remain largely unchanged. Therefore, the Project would not substantially degrade the existing visual character or quality of public views in a non-urbanized area. The impact would be less than significant.

- d) **Less-than-Significant Impact.** The Project is located in a predominantly agricultural area with minimal development, and existing sources of light or glare are limited to vehicle headlights along Hawkins Road, Bledsoe Road and other nearby agricultural roads.

The Project does not involve night-time construction. The only new permanent lighting that may be introduced is security lighting at the pump station. Lights would be directed downward and would not introduce a new substantial source of light and glare to the area. Additionally, the pump station may include reflective surfaces such as steel and other metals, however, they would not have substantial glaring effects. Therefore, there would be no new substantial light or glare that would adversely affect views in the area. Impacts related to lighting and glare would be less than significant.

References

- California Department of Transportation (Caltrans). 2018. California State Scenic Highways. Accessed December 4, 2025. <https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aaca>.
- Merced County. 2011. *Merced County 2030 General Plan: Natural Resources Element (Part II, Section 8)*. Accessed May 27, 2026. https://web2.co.merced.ca.us/pdfs/planning/generalplan/2030sections/mcgpu_2030gp_part_ii_8_nat_resources_pcrd_2011_06_14.pdf.
- Stanislaus County. 2016. *General Plan: Conservation/Open Space Element*. Accessed December 4, 2025. <https://www.stancounty.com/planning/pl/gp/gp-chapter3.pdf>.
-

3.2.2 Agriculture and Forestry Resources

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

Environmental Setting

The Project site contains land classified as Prime, Unique, and Farmland of Statewide Importance, according to the Farmland Mapping and Monitoring Program (CDC 2022a). According to the California Department of Conservation's Williamson Act Enrollment Finder (CDC 2022b), the Project area includes land enrolled in a Williamson Act contract. The Project site is not zoned as forest land or timberland, as defined by Public Resources Code §12220(g),² §4526,³ or Government Code §51104(g).⁴

Impact Analysis

- a) **Less-than-Significant Impact.** The Project involves infrastructure and pipeline installation on private farm roads, public roads, as well as lands that are not in active agricultural production within Stanislaus and Merced counties. Lands within the Project site are classified as Prime

² "Forest land" is land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.

³ "Timberland" means land, other than land owned by the federal government and land designated by the board as experimental forest land, which is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species shall be determined by the board on a district basis.

⁴ "Timberland production zone" or "TPZ" means an area which has been zoned pursuant to [Section 51112](#) or [51113](#) and is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses, as defined in subdivision (h). With respect to the general plans of cities and counties, "timberland preserve zone" means "timberland production zone."

Farmland, Unique Farmland, and Farmland of Statewide Importance (CDC 2022). Project construction could require the removal of potentially one row of orchard trees along east–west and north–south segments of the conveyance pipeline alignment located on and next to private, unimproved farm roads, as well as potentially up to 20 orchard trees as part of the Mustang Creek re-channelization. These removals would not result in the conversion of farmland to non-agricultural land use. The Project also involves construction of the pump station on a vacant site, not in agricultural use, and construction of the pipeline routed down existing unimproved farm roads and paved public roads, with little to no existing vegetation, and would not result in the conversion of farmland.

The proposed regulating basin would be constructed on approximately 7.5 acres of land designated as Unique Farmland and Farmland of Statewide Importance within Stanislaus County. This parcel is not in active agriculture use. As of 2020, Stanislaus County contained 249,994 acres of Prime Farmland, 124,208 acres of Unique Farmland and 33,161 acres of Farmland of Statewide Importance (CDC 2020). Thus, construction of the regulating basin on 7.5 acres would result in a negligible reduction of lands designated Prime Farmland, Unique Farmland and Farmland of Statewide Importance in Stanislaus County. Additionally, the basin is considered a compatible agricultural use as it would facilitate conveyance of replenishment water to offset demand for groundwater pumping and provide in-lieu recharge benefits for sustainability of the Turlock Subbasin. Therefore, the Project would directly benefit agricultural users who rely on local groundwater resources. For these reasons, impacts related to conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance would be less than significant.

- b) **Less-than-Significant Impact.** The Project site is classified as Prime Farmland, Unique Farmland, and Farmland of Statewide Importance, and lands within the Project site are enrolled in a Williamson Act contract. The Project would result in a reduction of land in Williamson Act contract from construction of the 7.5-acre regulating basin. However, the Project would convey replenishment water for irrigators south of the TID Main Canal and would not conflict with the existing agricultural zoning or the terms of the Williamson Act. The Project supports long-term agricultural viability by enhancing water supply reliability and sustainable groundwater management. Therefore, conflicts with existing zoning or Williamson Act contracts would be less than significant.
- c, d) **No Impact.** The Project site is not zoned as forest land or timberland. Therefore, there would be no loss of forest land or conversion of forest land to non-forest use and no impact would occur.
- e) **Less-than-Significant Impact.** As discussed above, the Project would result in an overall minimal amount of reduction of Unique Farmland and Farmland of Statewide Importance in Stanislaus County and lands in a Williamson Act contract from construction of the 7.5-acre regulating basin. The regulating basin would be considered a compatible agricultural use as it would facilitate conveyance of replenishment water for water supply reliability and groundwater recharge, thereby directly benefiting agricultural users who rely on local groundwater resources. The Project would not involve other changes in the existing Project site area that would result in conversion of Farmland to non-agricultural use. Therefore, impacts would be less than significant.

References

CDC (California Department of Conservation). 2020. Stanislaus County 2018–2020 Land Use Conversion.

CDC. 2022a. California Important Farmland Finder. Accessed November 4, 2025.
<https://maps.conservation.ca.gov/DLRP/CIFF/>.

CDC. 2022b. California Williamson Act Enrollment Finder. Accessed November 4, 2025.
<https://maps.conservation.ca.gov/dlrp/WilliamsonAct/>.

3.2.3 Air Quality

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

Environmental Setting

Climate and meteorological conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. The Project is located within the San Joaquin Valley Air Basin (SJVAB) which is comprised of Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties and the western and central portions of Kern County. The SJVAB is bordered by the Sierra Nevada Mountains in the east, the Coast Ranges in the west, and the Tehachapi mountains in the south. The bowl-shaped topography of the basin inhibits movement of pollutants out of the Valley.

Criteria Air Pollutants

Criteria air pollutants are a group of six common air pollutants for which the United States Environmental Protection Agency (U.S. EPA) has set ambient air quality standards. Criteria air pollutants include ground level ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter (PM), and lead. PM is classified by particle size. PM₁₀ consists of particulate matter that is 10 microns⁵ or less in diameter, while PM_{2.5} refers to the subset of PM₁₀ that is 2.5 microns or less in diameter. Most of the criteria air pollutants are directly emitted; however, ozone is a secondary pollutant that is formed in the atmosphere by chemical reactions between oxides of nitrogen (NO_x) and reactive organic gases (ROG) in the presence of sunlight as discussed below.

Ozone

Ozone (O₃) is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving ROG and NO_x, including NO₂ in the presence of sunlight. ROG and NO_x are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours.

⁵ A micron is one-millionth of a meter.

Ozone is a regional air pollutant because it is not emitted directly by sources but is formed downwind of sources of ROG and NO_x under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when long sunny days combined with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

Particulate Matter

Respirable particulate matter (PM₁₀) and fine particulate matter (PM_{2.5}) represent fractions of particulate matter that can be inhaled into air passages and the lungs and cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain absorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates can also damage materials and reduce visibility.

Toxic Air Contaminants

Toxic air contaminants (TACs) are a diverse group of air pollutants that can cause chronic and acute adverse effects on human health, including birth defects, neurological damage, cancer, and death. There are over 200 TACs with varying degrees of toxicity identified by the state of California (CARB 2025). Individual TACs vary greatly in the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

The primary TAC of concern is diesel particulate matter (DPM) which is emitted as diesel exhaust. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. The California Air Resources Board (CARB) classified DPM as a TAC in 1998, citing its potential to cause cancer and other health problems (CARB 1998). The U.S. EPA concluded that long-term exposure to diesel engine exhaust is likely to pose a lung cancer risk to humans and can also contribute to other acute and chronic health effects (U.S. EPA 2022). Mobile sources such as trucks and buses are among the primary sources of diesel emissions, and concentrations of DPM are higher near heavily traveled highways.

Sensitive Receptors

Air quality does not affect every individual in the population in the same way, and some groups are more sensitive to adverse health effects than others. More sensitive population groups include the elderly and the young; those with respiratory disease, such as asthma and chronic obstructive pulmonary disease; and those with other environmental or occupational health exposures (e.g., indoor air quality) that affect cardiovascular or respiratory diseases. The San Joaquin Valley Air Pollution Control District (SJVAPCD) defines sensitive land uses as schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling units (SJVAPCD, 2015). Workers are not considered sensitive receptors because they have other legal protections; specifically, employers must follow regulations set forth by the Occupation Safety and Health Administration (OSHA) to ensure the health and well-being of their employees (OSHA 2011).

The Project is located in an area with land uses consisting of rural, agricultural, and grazing areas. The residential receptor nearest to work areas is located approximately 300 feet away from the proposed conveyance pipeline along Bledsoe Road.

Valley Fever

Valley Fever (formally known as Coccidioidomycosis) is an infectious disease caused by the fungus *Coccidioides immitis*. Valley Fever is also known as San Joaquin Valley Fever, Desert Fever, or Cocci. Infection is caused by inhalation of *Coccidioides immitis* and *Coccidioides posadasii* spores that have become airborne when dry, dusty soil or dirt is disturbed by natural processes such as wind or earthquakes, or by human induced ground disturbing activities such as construction and farming. High winds can carry dust that contains the spores over long distances.

Most people infected with Valley Fever have no symptoms; however, if symptoms develop, they usually develop in the lung and initially resemble the flu or pneumonia (e.g., fatigue, cough, shortness of breath, chest pain, fever, rash, headache, and joint aches). Valley Fever is not contagious, and secondary infections are rare. On average, there were approximately 200 Valley Fever-associated deaths each year (deaths in which Valley Fever was listed as a primary or contributing cause on a death certificate) in the United States between 1999 and 2023. Those most at risk of developing severe symptoms include Hispanics, African Americans, Filipinos, pregnant women, adults of older age groups, and people with weakened immune systems (CDC 2024).

Coccidioidomycosis is highly endemic (consistently present and has a high prevalence) in the San Joaquin Valley and remains an important public health problem in California. As a population with more than 20 cases per year of San Joaquin Valley Fever per 100,000 people are considered high endemic. The Centers for Disease Control and Prevention (CDC) reports that farm workers, construction workers, others who engage in soil-disturbing activities, and anyone spending time outdoors are at risk for Valley Fever.

Regulatory Setting

Air quality within the SJVAB is addressed through the efforts of various federal, state, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policymaking, education, and a variety of programs. The air pollutants of concern and agencies primarily responsible for improving the air quality within the SJVAB and the pertinent regulations are discussed below. The SJVAPCD is the jurisdictional entity in the SJVAB.

Federal

Clean Air Act and National Ambient Air Quality Standards

The federal Clean Air Act (CAA) requires the U.S. EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment. The U.S. EPA has set NAAQS for criteria air pollutants: ozone, NO₂, SO₂, CO, PM (PM₁₀ and PM_{2.5}), and lead. The U.S. EPA classifies geographic areas as either attainment or non-attainment for each criteria air pollutant, based on whether the NAAQS have been achieved. Air districts in areas that are designated non-attainment must prepare regional air quality plans, discussed in further detail below, to be included in the overall State Implementation Plan. Areas that have a “maintenance” designation have been non-attainment for a certain criteria pollutant but have been re-designated as attainment. The SJVAB is currently classified as nonattainment for the federal 8-hour ozone and the federal PM_{2.5} standards.

State

California Clean Air Act and California Ambient Air Quality Standards

At the state level, the CARB oversees California air quality policies and regulations. California has adopted its own air quality standards, known as the California Ambient Air Quality Standards (CAAQS), which are at least as protective as the NAAQS and are often more stringent, although for some pollutants—such as the annual PM_{2.5} standard—the current federal standard is more stringent. The California CAA calls for the designation of areas as attainment or non-attainment based on state ambient air quality standards (i.e., the CAAQS), rather than the federal standards. The California CAA requires each air district in which CAAQS are exceeded to prepare a plan that documents reasonable progress toward attainment. If an air basin (or portion thereof) exceeds the CAAQS for a particular criteria air pollutant, it is considered to be in non-attainment for that criteria air pollutant until the area can demonstrate compliance. The SJVAPCD is designated nonattainment for the state 01-hour ozone, 8-hour ozone, PM₁₀, and PM_{2.5} standards.

Regional

SJVAPCD Air Quality Plans

As discussed above, the SJVAB is designated as a non-attainment area for the federal 8-hour ozone, federal PM_{2.5}, state 1-hour ozone, state 8-hour ozone, state PM₁₀, and state PM_{2.5} standards. As a result, the SJVAPCD is required to prepare air quality plans under the federal and California CAA to meet the federal and state air quality standards for these pollutants. Maintenance plans are required for attainment areas that had previously been designated non-attainment to ensure continued attainment of the standards.

Current air quality plans for the SJVAB include:

- 2024 Plan for the Annual PM_{2.5} Standard (SJVAPCD 2024);
- 2007 PM₁₀ Maintenance Plan and Request for Redesignation (SJVAPCD 2007);
- 2020 Reasonably Available Control Technology Demonstration for the 8-Hour Ozone State Implementation Plan (SJVACPD 2020); and
- 2022 Plan for the 2015 8-Hour Ozone Standard (SJVAPCD 2022).

The air quality plans include emissions inventories that identify sources of air pollutants, evaluations for feasibility of implementing potential opportunities to reduce emissions, sophisticated computer modeling to estimate future levels of pollution, and a strategy for how air pollution will be further reduced.

SJVAPCD CEQA Thresholds of Significance

The SJVAPCD published its *Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI)* in March 2015 (SJVAPCD 2015). The GAMAQI is an advisory document that provides lead agencies, consultants, and project proponents with procedures for assessing air quality impacts and preparing environmental review documents. The document describes the criteria that the SJVAPCD uses when reviewing and commenting on the adequacy of environmental documents. It recommends thresholds for use in determining whether projects would have significant adverse environmental impacts, identifies methods for predicting project emissions and impacts, and identifies measures that can be used to avoid or reduce air quality impacts (SJVAPCD 2015).

SJVAPCD Rules and Regulations

Emissions sources associated with the Project would be subject to the regulatory requirements in the SJVAPCD rules and regulations. The SJVAPCD rules that would be applicable to construction activities associated with the Project include those under Regulation VIII, *Fugitive PM₁₀ Prohibitions*. Specifically, SJVAPCD Rule 8021 (Construction, Demolition, Excavation, Extraction, and other Earthmoving Activities) would require implementation of measures during Project construction to prevent, reduce, or mitigate anthropogenic fugitive dust emissions.

Regulation VIII (Fugitive PM₁₀ Prohibitions)

Regulation VIII contains rules developed pursuant to U.S. EPA guidance for serious PM₁₀ non-attainment areas. Rule 8021 limits fugitive dust PM₁₀ emissions from the following sources: construction, demolition, excavation, extraction, and other earth-moving activities, bulk materials handling, carryout and track-out, open areas, paved and unpaved roads, unpaved vehicle/equipment traffic areas, and agricultural sources. **Table 3.2-1** contains the Rule 8021 requirements that would apply during construction of the Project's infrastructure components. Control measures that must be implemented during Project construction activities pursuant to Rule 8021 include use of water, barriers, or chemical stabilizers sufficient to limit visible dust emissions to 20 percent opacity.

TABLE 3.2-1
SJVAPCD RULE 8021 NON-ADMINISTRATIVE MEASURES
AND NOTIFICATION REQUIREMENTS POTENTIALLY APPLICABLE TO THE PROJECT

No.	Measure
5.2	A person shall control the fugitive dust emissions to meet the requirements in [SJVAPCD] Table 8021-1
5.3.1	An owner/operator shall limit the speed of vehicles traveling on uncontrolled unpaved access/haul roads within construction sites to a maximum of 15 miles per hour.
5.3.2	An owner/operator shall post speed limit signs that meet state and federal Department of Transportation standards at each construction site's uncontrolled unpaved access/haul road entrance. At a minimum, speed limit signs shall also be posted at least every 500 feet and shall be readable in both directions of travel along uncontrolled unpaved access/haul roads.
5.4.1	Cease outdoor construction, excavation, extraction, and other earthmoving activities that disturb the soil whenever visible dust emissions exceed 20 percent opacity. Indoor activities such as electrical, plumbing, dry wall installation, painting, and any other activity that does not cause any disturbances to the soil are not subject to this requirement.
5.4.2	Continue operation of water trucks/devices when outdoor construction excavation, extraction, and other earthmoving activities cease, unless unsafe to do so.
6.3.1	An owner/operator shall submit a Dust Control Plan to the Air Pollution Control Officer (APCO) prior to the start of any construction activity on any site that will include 10 acres or more of disturbed surface area for residential developments, or 5 acres or more of disturbed surface area for non-residential development, or will include moving, depositing, or relocating more than 2,500 cubic yards per day of bulk materials on at least three days. Construction activities shall not commence until the APCO has approved or conditionally approved the Dust Control Plan. An owner/operator shall provide written notification to the APCO within 10 days prior to the commencement of earthmoving activities via fax or mail. The requirement to submit a dust control plan shall apply to all such activities conducted for residential and non-residential (e.g., commercial, industrial, or institutional) purposes or conducted by any governmental entity.
6.3.3	The Dust Control Plan shall describe all fugitive dust control measures to be implemented before, during, and after any dust-generating activity.
6.3.4	A Dust Control Plan shall contain all the [administrative] information described in Section 6.3.6 of this rule. The APCO shall approve, disapprove, or conditionally approve the Dust Control Plan within 30 days of plan submittal. A Dust Control Plan is deemed automatically approved if, after 30 days following receipt by the District, the District does not provide any comments to the owner/operator regarding the Dust Control Plan.

Source: SJVAPCD, 2004

Local

Table 3.2-2 summarizes the key policies for air quality identified in the Stanislaus and Merced County General Plans.

**TABLE 3.2-2
COUNTY GENERAL PLAN POLICIES GOVERNING AIR QUALITY**

General Plan	Policies Governing Air Quality
Stanislaus County	Conservation/Open Space Element, Policy Six
Merced County	Chapter AQ, Air Quality Element, Policies AQ-2.1, AQ-2.2, AQ-2.3, AQ-2.4, AQ-2.5, AQ-2.7, AQ-5.2, AQ-6.1 and AQ-6.1

Impact Analysis

- a) **Less-than-Significant Impact.** As discussed previously, the SJVAB is currently designated as a non-attainment area for federal and state standards with regard to PM_{2.5} and ozone. It is also designated as a non-attainment area for state PM₁₀ standards. The SJVAPCD is responsible for implementing programs and regulations required by the federal CAA and the California CAA within the SJVAB. In this capacity, the SJVAPCD has prepared plans to attain federal and state ambient air quality standards for which it has been designated as non-attainment including the 2024 Plan for the 2012 Annual PM_{2.5} standards; 2007 PM₁₀ Maintenance Plan and Request for Redesignation; 2020 Reasonably Available Control Technology Demonstration for the 8-Hour Ozone State Implementation Plan; and 2022 Plan for the 2015 8-Hour Ozone Standard.

The SJVAPCD's GAMAQI provides recommended procedures for evaluating potential air quality impacts during the environmental review process consistent with CEQA requirements and includes assessment methodologies for air toxics, odors, and GHG emissions. Based on the GAMAQI, the Project's air quality impacts during construction or operations would be considered significant if emissions generated exceed the thresholds of significance presented in the GAMAQI. These thresholds of significance are based on the SJVAPCD's New Source Review offset requirements for stationary sources and are applicable to both stationary and non-stationary emissions sources, including project-level sources of criteria air pollutants (SJVAPCD 2015). As discussed in the GAMAQI, "the District's [SJVAPCD's] attainment plans demonstrate that project-specific emissions below the District's [SJVAPCD's] offset thresholds would have a less-than-significant impact on air quality. Thus, the District [SJVAPCD] concludes that use of New Source Review Offset thresholds as thresholds of significance for criteria air pollutants under CCR Section 15064.7 is an appropriate and effective means of promoting consistency in significance determinations within the environmental review process" (SJVAPCD 2015). Therefore, projects with emissions below the thresholds of significance for criteria pollutants would be determined to not conflict with or obstruct implementation of the SJVAPCD's air quality plans. As discussed under criterion (b) below, the Project would not generate emissions from either construction or operation that would exceed the SJVAPCD thresholds of significance; therefore, the Project would not conflict with or obstruct the implementation of the SJVAPCD's air quality plans and the impact would be less than significant.

- b) **Less-than-Significant Impact.** By its very nature, air pollution is largely a cumulative impact. CEQA defines *cumulative impacts* as two or more individual impacts which, when considered together, are either significant or “cumulatively considerable,” meaning they add considerably to a significant environmental impact. An adequate cumulative impact analysis considers a project over time and in conjunction with other past, present, and reasonably foreseeable future projects whose impacts might compound those of the project being assessed. No single project would likely be sufficient in size, by itself, to result in non-attainment of the regional air quality standards. Instead, a project’s emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development within the SJVAB. The non-attainment status of the SJVAB with respect to regional pollutants is a result of past and present development. Future attainment of state and federal ambient air quality standards is a function of successful implementation of SJVAPCD’s attainment plans. Consequently, the SJVAPCD’s application of thresholds of significance for criteria pollutants is a relevant way to determine whether a project’s individual emissions would have a cumulatively significant impact on air quality.

Air pollutant emissions that would be related to the construction and operations of the Project were calculated using the California Emissions Estimator Model (CalEEMod) (version 2022.1.1.43). CalEEMod contains default data specific to each California air basin and quantifies direct emissions from construction and operation (including off-road equipment and on-road vehicle use). CalEEMod uses EMFAC and OFFROAD emission factors to estimate emissions from on-road vehicles and off-road equipment, respectively.

Construction Emissions

Construction activities associated with the Project would require the use of trucks/vehicles and heavy construction equipment (e.g., excavators, loaders, rollers, etc.). Construction of the Project was modeled over an approximately 12-month period beginning in July 2028. Construction was assumed to occur five days per week.

Results of the construction emissions modeling are summarized in **Table 3.2-3**. As shown, the total emissions that would be generated from construction of the Project would not exceed the applicable SJVAPCD thresholds of significance. Therefore, the Project would have a less-than-significant impact with respect to construction emissions of criteria air pollutants. Refer to **Appendix A** for CalEEMod input assumptions and emissions estimates.

**TABLE 3.2-3
PROJECT CONSTRUCTION EMISSIONS SUMMARY**

Construction Year/ Significance Criteria	Construction Emissions (tons per year)					
	CO	NOx	ROG	SOx	PM ₁₀	PM _{2.5}
2028	3.69	2.63	0.35	0.01	0.21	0.12
Total Project Emissions	3.69	2.63	0.35	0.01	0.21	0.12
SJVAPCD Threshold	100	10	10	27	15	15
Significant?	No	No	No	No	No	No
SOURCE: ESA, 2026. Appendix A.						

Fugitive PM₁₀ emissions come from the following sources: construction, excavation, extraction and other earth moving activities, bulk materials handling, carryout, and track-out, open areas, paved and unpaved roads, unpaved vehicle/equipment traffic areas, and agricultural sources. Table 3.2-1 lists the control measures that the Project would be required to implement during construction, operations and maintenance activities that involve ground disturbance pursuant to Rule 8021, Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities. The Project would be subject to this regulation and construction activities would be required to comply with measures listed in Table 3.2-1 to reduce fugitive dust emissions. An approved dust control plan would be required as the Project is anticipated to trigger 5 acres or more of disturbed surface area for non-residential development, and includes the moving, depositing, or relocating more than 2,500 cubic yards per day of bulk materials on at least three days.

Operational Emissions

Once operational, the Project would generate minimal direct emissions from occasional vehicle trips to the project site (primarily the pump station) for operation and maintenance activities. It is anticipated that vehicle trips would be made by light-duty vehicles. The expected daily pollutant emissions from these operational activities would be nominal and would not generate emissions that would exceed the applicable SJVAPCD thresholds of significance.

Conclusion

As discussed above, construction and operation of the Project would generate emissions of criteria air pollutants that would be less than the SJVAPCD recommended thresholds of significance. Therefore, the Project would not result in a cumulatively considerable net increase of any criteria air pollutant for which the Project region is designated as a non-attainment area under an applicable federal or state ambient air quality standard, and this impact would be less than significant.

- c) **Less-than-Significant Impact.** Sensitive land uses are those where sensitive population groups are located and include residences, schools, hospitals, convalescent homes, and other facilities where people spend significant amounts of time. Air pollutant impacts related to increased community health risk can occur by introducing new sources of criteria air pollutants or TACs with the potential to adversely affect existing sensitive receptors in the Project vicinity.

Diesel Particulate Matter

When evaluating health risk impacts, a 1,000-foot zone of influence is generally recommended, outside of which health risks to sensitive receptors would be considered less than significant. For example, studies show that DPM concentrations at 1,000 feet from the source are reduced by more than 80 percent compared to concentrations directly at the source (CARB 2005). The surrounding land use consists of agricultural lands and animal grazing. The nearest sensitive receptor is located approximately 300 feet away from the proposed conveyance pipeline within Bledsoe Road. However, construction for this part of the Project is linear in nature and construction activity would not be occurring near any one receptor for the entire duration of construction.

Project construction activities would generate TACs in the form of DPM from the use of heavy-duty, diesel-fueled construction equipment and diesel-fueled haul trucks. The majority of construction activities would be linear along the excavation path for the proposed pipelines and conveyance channel. Given the short construction duration of 12 months in comparison to the 30-year exposure assumed in health risk assessments (Office of Environmental Health Hazard Assessment 2015), the linear nature of majority of the construction activity, and the low levels of construction emissions, DPM emissions during construction would not result in significant health risks exceeding SJVAPCD thresholds at the nearest sensitive receptor location. Furthermore, the Project would be consistent with the applicable SJVAPVD requirements and control strategies intended to reduce emissions from construction equipment and activities. The Project would comply with the CARB Air Toxics Control Measure that limits diesel-powered equipment and vehicle idling to no more than 5 minutes at a location, and the CARB In-Use Off-Road Diesel Vehicle Regulation; compliance with these regulations would minimize emissions of TACs during construction.

Operational emissions of TACs would be nominal, as operational activities would be limited to occasional vehicle trips to the site for maintenance activities as well as operation of the pump station associated with the flood water recharge of existing farmlands. It is likely that vehicle trips would be made by light-duty vehicles that are unlikely to be diesel-fueled, and the operational water pumps would be driven by electric motors. Due to the limited operational activities that could result in DPM emissions and the absence of nearby sensitive receptors, DPM emissions generated from operation of the Project would not result in a health impact to sensitive receptors.

Health Effects of Criteria Air Pollutants

The health effects that are associated with emissions of criteria pollutants are described above under the *Criteria Air Pollutants* discussion.

As discussed under criterion (b), above, construction and operation of the Project would not result in emissions that exceed the SJVAPCD's annual emissions thresholds for any of the criteria pollutants. Therefore, criteria pollutant emissions from Project-related activities would not be reasonably anticipated to cause or contribute to the exposure of sensitive receptors to ground-level ozone concentrations in excess of health-protective levels nor would the Project criteria pollutant emissions be anticipated to cause other adverse health effects.

Valley Fever

As discussed above, the Central Valley is the region of California considered to be of highest risk for the development of Valley Fever (CDPH 2020); therefore, Valley Fever is a health risk of concern in relation to the Project. While Valley Fever is a risk for anyone living or working in the Project vicinity, dust that may be generated during ground disturbance activities associated with the Project would not be expected to increase this risk to areas residents as the closest residence is approximately 300 feet from Project work areas.

Project construction activities generating dust could pose an increased risk of exposure to the *Coccidioides immitis* fungus spores for Project construction workers involved in or otherwise present during excavation such as grading and trenching and transport of soils. According to the

California Department of Public Health (CDPH) and the CDC, avoiding working in soils and dusty conditions is the best preventative measure. Since some construction workers cannot avoid participating in soil disturbance activities, minimizing fugitive dust as well as other engineering controls are the primary preventative measures. In addition, the CDPH Occupational Health Branch and the CDC make recommendations for the protection of workers. The primary protection measures relate to the following: worker training, dust suppression, and personal protective equipment (PPE). With respect to dust suppression, SJVAPCD Rule 8021 would require the Project to reduce visible dust emissions to less than 20 percent opacity (SJVAPCD 2019). Use of PPE and compliance with Rule 8021 would ensure the Project's compliance with these regulatory requirements and would ensure that the potential impacts from Valley Fever would be less than significant.

- d) **Less-than-Significant Impact.** The Project may create temporary construction odors from combustion of diesel fuel in equipment engines; however, the majority of construction activities near sensitive receptors would be linear, not occurring in one location for an extended period of time, and would cease at the conclusion of construction. Any odorous emissions generated from construction of the Project would dissipate rapidly and would not be expected to be noticeable at the nearest residential receptor which is approximately 300 feet from the nearest Project work area. Once operational, there would be no sources of odor associated with the Project. Therefore, the Project would not generate other emissions, including odors, which would result in a significant impact.

References

- CARB (California Air Resources Board). 1998. *Report to the Air Resources Board on the Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant*. April 22, 1998. Accessed January 2026. https://ww2.arb.ca.gov/sites/default/files/classic/toxics/dieseltac/part_a.pdf?_ga=2.152804090.2137726386.1650827342-1245246421.1562184877.
- CARB. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. April 2005. Accessed January 2026.
- CARB. 2026. CARB Identified Toxic Air Contaminants. Accessed January 2026. <https://ww2.arb.ca.gov/resources/documents/carb-identified-toxic-air-contaminants>.
- CDPH (California Department of Public Health). 2020. *Epidemiologic Summary of Valley Fever (Coccidioidomycosis) in California, 2019*. September 2020. Accessed January 2026. <https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CocciEpiSummary2019.pdf>.
- Centers for Disease Control and Prevention. 2024. Valley Fever (Coccidioidomycosis) Statistics. April 24, 2024. Accessed January 2026. https://www.cdc.gov/valley-fever/php/statistics/?CDC_AAref_Val=https://www.cdc.gov/fungal/diseases/coccidioidomycosis/statistics.html.
- Merced County. 2012. *2030 Merced County General Plan: Air Quality Element*. Accessed January 2026. <https://www.countyofmerced.com/1926/Draft-General-Plan-Draft-Program-EIR#docaccess-965506687f8bbdc5dd31f501fe97bfeae249fb542b4b00a29c538befbcd442c4>.

- Office of Environmental Health Hazard Assessment. 2015. *Air Toxics Hot Spots Program, Risk Assessment Guidelines—Guidance Manual for Preparation of Health Risk Assessments*. February 2015. Accessed January 2026. oehha.ca.gov/media/downloads/crn/2015guidancemanual.pdf.
- OSHA (Occupational Safety and Health Administration). 2011. *Indoor Air Quality in Commercial and Institutional Buildings*. 2011. Accessed January 2026. <https://www.osha.gov/sites/default/files/publications/3430INDOOR-AIR-QUALITY-SM.pdf>.
- SJVAPCD (San Joaquin Valley Air Pollution Control District). 2004. *Rule 8021 – Construction, Demolition Excavation, Extraction, and Other Earthmoving Activities*. Accessed January 2026. <https://www.valleyair.org/media/bhfgzedn/rule-8021.pdf>.
- SJVAPCD. 2007. *2007 PM10 Maintenance Plan and Request for Redesignation*. September 20, 2007. Accessed January 2026. http://www.valleyair.org/Air_Quality_Plans/docs/Maintenance%20Plan10-25-07.pdf.
- SJVAPCD. 2015. *Guidance for Assessing and Mitigating Air Quality Impacts*. March 19, 2015. Accessed January 2026. <https://www.valleyair.org/media/2aumgx1i/apr-1925.pdf>.
- SJVAPCD. 2019. *Policy for District Rule 2201 AAQA Modeling*. April 2014. Revised March 10, 2019. Accessed January 2026. https://www.valleyair.org/policies_per/Policies/APR-1925.pdf.
- SJVAPCD. 2020. *2020 Reasonably Available Control Technology (RACT): Demonstration for the 2015 8-Hour Ozone Standard*. June 18, 2020. Accessed January 2026. <https://www.valleyair.org/media/3xrdxpvl/2020-ract-demonstration.pdf>.
- SJVAPCD. 2022. *2022 Plan for the 2015 8-Hour Ozone Standard*. Adopted December 16, 2022. Accessed January 2026. <https://www.valleyair.org/media/q55posm0/0000-2022-plan-for-the-2015-8-hour-ozone-standard.pdf>.
- SJVAPCD. 2024. *2024 Plan for the 2012 Annual PM2.5 Standard*. June 20, 2024. Accessed January 2026. <https://www.valleyair.org/media/gw5bacvj/2024-pm25-plan.pdf>.
- Stanislaus County. 2016. *General Plan: Conservation/Open Space Element*. Adopted April 2016. Accessed January 2026. <https://www.stancounty.com/planning/pl/gp/current/gp-chapter3.pdf>.
- U.S. EPA (United States Environmental Protection Agency). 2002. *Health Assessment Document for Diesel Engine Exhaust*. May 2002. Accessed January 2026. <https://cfpub.epa.gov/ncea/risk/recorddisplay.cfm?deid=29060>.
-

3.2.4 Biological Resources

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than- Significant Impact</i>	<i>No Impact</i>
IV. BIOLOGICAL RESOURCES — Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Environmental Setting

Biological Communities and Wildlife Habitats

The biological resources study area (BRSA) for this Initial Study includes the Project infrastructure construction disturbance area footprint plus a 100 foot buffer beyond the disturbance area, including the pump station, pipeline alignment, Mustang Creek, the regulating basin, and the culvert crossings of Sand Creek. The full project study area is shown on Figure 2-3. Biological communities within the BRSA could provide potential habitat for special-status species. These areas are described below and discussed in more detail in the “Eastside Aquifer Restoration Initiative, Biological Constraints Report” (ESA 2026a) and “Eastside Aquifer Restoration Initiative, Aquatic Resource Delineation Report” (ESA 2026b) included, respectively, as **Appendix B** and **Appendix C** of this IS. Upland biological communities within the BRSA include a variety of agriculture crops and disturbed areas. Plant communities and habitats associated with aquatic settings within the BRSA include freshwater emergent wetlands, vernal pools, intermittent and ephemeral streams, and agricultural ditches (ESA 2026a). ESA conducted a formal delineation of aquatic resources at the same time as the biological reconnaissance survey and determined that there is a potential waters of the U.S. and waters of the state occurring within the survey area (ESA 2026b).

Irrigated Agriculture

Irrigated crops in the BRSA include pistachios, grape vineyards, and almonds. Agricultural land within the BRSA has been graded and undergoes frequent, generally seasonal cycles of crop growth and harvesting, along with applications of irrigation water, fertilizers, and pesticides. In general, the

agricultural fields in the BRSA are kept clean with very few weeds at the field margins, healthy crops, well-maintained roads, and properly functioning drainage and irrigation systems.

Generally, croplands support relatively low plant and animal diversity, but the value of agricultural lands for special-status and common wildlife species varies among crop types and agricultural practices. Agricultural lands close to natural land cover can provide functions that complement and increase the habitat value of the natural land cover.

Several fallow fields border the sides of the BRSA. Agricultural practices use fallow fields to encourage soil recovery in between growing cycles. Fallow fields are temporary and become irrigated agricultural regularly.

Disturbed/Ruderal

Disturbed habitat is characterized by predominately introduced non-native species in native habitat areas as a result of human actions and does not include areas that are artificially irrigated. Disturbed/ruderal areas include dirt, gravel, and paved roads throughout the BRSA, as well as the pump station and regulating basin sites. These areas are either unvegetated with heavily compacted substrate or are sparsely to densely vegetated with non-native ruderal species such as oat (*Avena* sp.), purple false brome (*Brachypodium distachyon*), ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis*), short-pod mustard (*Hirschfeldia incana*), thistles (*Cirsium* spp.), and stinkwort (*Dittrichia graveolens*).

Freshwater Emergent Wetland

Emergent wetlands identified in the BRSA occur along the various drainages crossed by the pipeline alignment that pond water or remain saturated for extended periods during a portion of the year, often throughout the wet season, then dry up in spring or early summer.

Dominant plant species include narrow leaf cattail (*Typha angustifolia*, OBL), taper tip flatsedge (*Cyperus acuminatus*, OBL), coyote willow (*Salix exigua*, FACW) and poison hemlock (*Conium maculatum*, FACW).⁶ Surface water was present in the study area at the time of the survey.

Mustang Creek

Intermittent streams, also referred to as seasonal streams, are present during certain times of the year. The identified intermittent stream in the BRSA is Mustang Creek which intersects an ephemeral drainage adjacent to Bledsoe Road and an entire segment of the feature is present at the southern edge of the BRSA. Mustang Creek is an artificially altered channel that conveys stormwater during rain events but is typically dry outside of the rainy season. No flowing surface water was observed during the survey. Within the study area, this stream exhibits a natural bed and bank. During the time of the survey, an Ordinary High Water Mark was observed along the entirety of the feature. Mustang Creek is artificially connected to the TID High Line Canal, which is connected to the Merced River. As the Merced River is a Navigable Waterbody of the U.S., Mustang Creek would therefore be considered a potential Water of the

⁶ FAC = facultative (occurs in wetlands and non-wetlands); FACW = facultative wetland (usually occurs in wetlands but may occur in non-wetlands); OBL = obligate wetland (almost always occurs in wetlands under natural conditions); NL = not listed.

U.S. under current Clean Water Act Section 404 regulations, as discussed in the Aquatic Resources Delineation Report (Appendix C).

Sand Creek

Sand Creek was a historic intermittent drainage but was artificially altered, and the portion within the BRSA does not convey irrigation flows nor exhibit any features that characterize it as a state or federal jurisdictional water or wetland. Habitat is a combination of ruderal species and agriculture.

Ephemeral Streams/ Agricultural Ditches

Ephemeral streams are present temporarily. The identified ephemeral ditches in the BRSA are small and shallow ditches in the agriculture fields within the survey area. The ditches were characterized as exhibiting ephemeral hydrology based on field observations and analysis of historical aerial imagery, indicating that surface flow is primarily driven by agricultural runoff and storm events.

Playa Pool

The mapped playa pool (known as Rouse Lake) represents a small portion of a larger playa feature located on the east side of the BRSA, outside the Project site. This playa pool collects stormwater and agricultural runoff. During the survey, the pool was dry except for water present at the culvert outlet, and cattle were observed grazing in the area.

Pond

The pond feature is an isolated, small pond approximately 35 feet in diameter and 6 feet deep just south of TID Main Canal near the pump station site. It appears to be associated with agricultural pumping operations. Surface water was present at the time of the survey.

Northern Hardpan Vernal Pools

Northern Hardpan vernal pools are a sensitive natural community with a state rank of S3.1 indicating they are vulnerable and have a moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors. This community is restricted to the northeastern portion of the Project site just outside Rainbow Farms.

Impact Analysis

- a) **Less-than-Significant Impact with Mitigation Incorporated.** No special-status species were observed within the BRSA during the December 1 and 2, 2025, and May 4, 2026, reconnaissance surveys (ESA 2026a). A list of special-status species with potential to occur on or in the vicinity of the BRSA was compiled from a nine-quad search of the California Natural Diversity Database (CNDDB) (CDFW 2025), a nine-quad search on the California Native Plant Society's (CNPS) Rare Plant Inventory (CNP 2025), a BRSA search of the U.S. Fish and Wildlife Service (USFWS) endangered species database (USFWS 2026), and biological literature review of the region for the surrounding 7.5-minute USGS topographic quadrangles. The quadrangles for the BRSA were Montpelier, Turlock Lake, Winton, Cressey, Turlock, Denair, Waterford, Paulsell, and Cooperstown.

From the full list of species, each species was individually assessed based on habitat requirements and distribution relative to vegetation communities and habitat features that occur in and around

the BRSA (ESA 2026a). Based on the habitat types and conditions within the BRSA, along with review of background information and database searches, the following special-status plant species were determined to have at least a moderate potential to occur within the Northern Hardpan vernal pool and playa pool portions of the BRSA and potential to be affected by the Project: Hoover's spurge (*Euphorbia hooveri*) and Colusa grass (*Neostapfia colusana*). The following special-status wildlife species were determined to have at least a moderate potential to occur within or near the BRSA and potential to be affected by the Project: California tiger salamander - central California DPS (*Ambystoma californiense* pop. 1), western spadefoot (*Spea hammondi*), and tricolored blackbird (*Agelaius tricolor*).

Despite the potential for these special-status species to occur with the Project BRSA, there is minimal potential of adverse effects to special-status species during Project construction, either directly or through habitat modifications, because the Project construction disturbance would largely be limited to existing disturbed areas along the existing agricultural access roads and disturbed/ ruderal habitat. There is the potential for western spadefoot and tricolored blackbird to occur in the portion of re-channelization of Mustang Creek. There is the potential for indirect impacts to special-status species that may occur on the adjacent wetland or agricultural land due to noise and visual disturbance. Through implementation of the following mitigation measures, potential impacts associated with Project construction would be avoided or reduced to a less-than-significant level.

MM BIO-01: Special-Status Plant Species Avoidance and Relocation. Prior to any ground disturbance within or adjacent to wetland and aquatic habitat, a qualified biologist shall conduct pre-construction surveys for special-status plant species in suitable habitat areas subject to ground disturbing activities or within 50 feet of ground disturbing activities. The surveys shall be conducted during bloom season, typically during the months of March and June, and prior to ground-disturbing activities. The biologist shall work with the construction contractor to mark and avoid disturbance of locations of special-status plant species where feasible or prepare a relocation plan if avoidance is infeasible. The relocation plan shall include, but not be limited to, seed and soils collection, plant salvage, suitable relocation sites, monitoring requirements, and success criteria.

MM BIO-02: Special Status and Other Nesting Bird Protection Measures. If ground disturbance is scheduled to occur during the avian nesting season (February 1 through September 15), Eastside Water District or its contractor shall implement the following measures to avoid potential adverse effects to nesting birds including tricolored blackbird, raptors, including burrowing owl and Swainson's hawk, and other common and special-status nesting birds.

- Twenty-four hours prior to ground disturbance, a qualified biologist shall perform pre-activity surveys for nesting birds within 500 feet, and 0.5 miles for special-status raptors, of the work areas, where access is available. If pre-activity surveys indicate that nests are inactive or potential habitat is unoccupied during the ground disturbance period, no further surveys or avoidance are required. Trees and shrubs within the construction footprint determined to be unoccupied by nesting birds, or that are outside the no-disturbance buffer for active nests, could be removed.
- If active nests are detected during pre-activity surveys, a no-disturbance buffer shall be established around active raptor nests and nests of other special-status birds during the

breeding season, or until it is determined that young birds have fledged. Buffers shall be at least 250 feet for raptors and at least 150 feet for other nesting birds. Nests initiated within the active work area may have reduced buffer sizes due to the increased tolerance of disturbance. Reductions to nest buffer distances may be allowed on a case-by-case basis in coordination with the CDFW based on site-specific factors such as the existing disturbance levels, the species of nesting bird, and the magnitude of the proposed disturbance.

MM BIO-03: California Tiger Salamander Protection Measures. To avoid inadvertent impacts to California tiger salamander, the following mitigation measure should be implemented:

- All project staff will attend a worker environmental awareness training focused on California tiger salamander identification and reporting procedures.
- Forty-eight hours prior to ground disturbance, a qualified biologist shall perform protocol-level surveys for California tiger salamander and suitable small mammal burrows within 250 feet, where access is available, per USFW/CDFW guidance. If pre-activity surveys indicate that California tiger salamander is inactive or potential habitat is unoccupied during the ground disturbance period, no further surveys or avoidance are required.
- If pre-activity surveys indicate that California tiger salamander is active or potential habitat is occupied, all initial ground disturbance will require a full-time qualified biological monitor.
- If any work remains to be completed after October 15, the Contractor (under the direction of the Project Biologist) will install exclusion fencing and erosion control measures in those areas where construction activities need to be completed. The Project Biologist will document compliance through memoranda to the Mitigation Manager during the establishment of the fencing activities.
- If any individuals are encountered, a qualified biologist will relocate them to suitable habitat within the project area, outside the active disturbance zone.

MM BIO-04: Western Spadefoot Protection Measures. To avoid inadvertent impacts to western spadefoot, the following mitigation measure should be implemented if ground disturbance is scheduled to occur during the breeding season (October-June):

- Forty-eight hours prior to ground disturbance, a qualified biologist shall perform pre-activity surveys for western spadefoot and suitable small mammal burrows within 250 feet, where access is available. If pre-activity surveys indicate that western spadefoot is inactive or potential habitat is unoccupied during the ground disturbance period, no further surveys or avoidance are required.
- For seasonal avoidance of special-status vernal-pool-dependent species (e.g., western spadefoot toads), the Contractor will not work within 50 to 100 feet, or as determined by a qualified biologist, of suitable aquatic habitats (e.g., vernal pools, seasonal wetlands) from October 15 to June 1 (corresponding to the rainy season) or as determined through informal or formal consultation with the USFWS or USACE. Ground-disturbing activities may begin once the habitat is no longer inundated for the season and it is after April 15.

- If any work remains to be completed after October 15, the Contractor (under the direction of the Project Biologist) will install exclusion fencing and erosion control measures in those areas where construction activities need to be completed. The Project Biologist will document compliance through memoranda to the Mitigation Manager during the establishment of the fencing activities.
 - If any individuals are encountered, a qualified biologist will relocate them to suitable habitat within the project area, outside the active disturbance zone.
- b) **No Impact.** The BRSA contains one sensitive natural community, northern hardpan vernal pool. However, the area where this community is mapped is outside of the construction disturbance area and would not be directly or indirectly affected by the Project.
- c) **Less-than-Significant Impact with Mitigation Incorporated.** The Project would result in direct impacts to various wetlands and other waters including Mustang Creek through the re-channelization, potential placement of turnout structures and the conveyance pipeline crossing of several drainages (see Appendix C). Impacts and fill within these features would require approvals from the U.S. Army Corps of Engineers (USACE), Central Valley RWQCB and CDFW, and may require mitigation. Therefore, this impact would be potentially significant. Through implementation of the following mitigation measure, potential impacts associated with Project construction would be avoided or reduced to a less-than-significant level.
- MM BIO-5: Obtain Permit Approvals and Complete Required Mitigation for Impacts to Waters of the United States and State.** Impacts and fill within waters of the U.S. and state will require obtaining permit approvals from the USACE (Clean Water Act Section 404 Permit), Central Valley RWQCB (Clean Water Act Section 401 Water Quality Certification) and CDFW (Section 1602 Streambed Alteration Agreement) and may require the completion of compensatory mitigation activities to replace losses to these features. Compensatory mitigation may include purchasing credits from agency-approved mitigation banks or conducting other mitigation activities. The proposed Project shall obtain all necessary permits for impacts to waters of the U.S. and state and complete any mitigation requirements.
- d) **No Impact.** The BRSA is currently used for a variety of agricultural purposes. The TID Main Canal and Mustang Creek provide corridors for wildlife movement throughout the region, although there are no woody plant cover and little forage available. Wildlife that are able to pass through or over perimeter fencing may move through the BRSA from surrounding grasslands/agriculture. The Project would not alter these wildlife movement patterns. Therefore, the Project would not substantially interfere with wildlife movement.
- e) **No Impact.** The Project would not conflict with any local plans or policies for the protection of biological resources. The Project would not substantially alter any biological resources that may be protected by local plans and policies. The BRSA does not support any trees protected by local tree ordinances, and no trees would be removed, trimmed, or damaged during Project related work.
- f) **No Impact.** There is no adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plans that overlap with the Project area.

References

- CDFW (California Department of Fish and Wildlife). 2025. California Natural Diversity Database search for the U.S. Geological Survey 7.5-minute Bliss Ranch topographic quadrangle and surrounding 9 quadrangles. Commercial Version November 1, 2025. Accessed November 13, 2025. <https://apps.wildlife.ca.gov/rarefind/view/RareFind.aspx>.
- CNPS (California Native Plant Society). Rare Plant Program. *Rare Plant Inventory* [online edition, v9.5.1]. Accessed November 13, 2025. <https://www.rareplants.cnps.org>.
- ESA (Environmental Science Associates). 2026a. *Eastside Aquifer Restoration Initiative, Biological Constraints Report*. July 2026
- ESA. 2026b. *Eastside Aquifer Restoration Initiative, Aquatic Resource Delineation Report*. July 2026.
- USFWS (U.S. Fish & Wildlife Service). 2026. Information for Planning and Consultation (IPaC). Species list generated January 21, 2026. <https://ecos.fws.gov/ipac/>.
-

3.2.5 Cultural Resources

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than-Significant Impact</i>	<i>No Impact</i>
V. CULTURAL RESOURCES — Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

Environmental Setting

In October 2026, ESA completed the Eastside Aquifer Restoration Initiative Project: Cultural Resources Technical Report to inform the baseline conditions and identify cultural resources within the Project site (ESA 2026c). The information and analysis in this IS/MND section is derived from the ESA Cultural Resources Technical Report.

To identify cultural resources that could be impacted by the Project, the following tasks were completed (1) a records search at the Central California Information Center (CCaIC) of the California Historical Resources Information System, (2) an archaeological sensitivity assessment to analyze the potential for buried pre-contact and historic-period archaeological deposits, and (3) a field survey of the Project site.

Records Search Results

In November 2025 and May 2026, ESA conducted records searches of the Project site and a 0.5-mile radius at the CCaIC. The CCaIC records searches indicated that one previously recorded cultural resource (P-50-001890) intersects the Project site. And two previous cultural resources studies have been conducted within or intersecting the Project site. P-50-001890 is the Turlock Main Canal, a historic-era canal segment that is part of TID's system of canals and laterals from the La Grange Dam.

Archaeological Sensitivity Assessment

The underlying geology of the Project site consists primarily of the upper member of the Turlock Lake Formation deposits, with small segments in the middle of the pipeline line overlying the upper and lower members of the Modesto Formation and the southern end terminating in the upper member of the Riverbank Formation. The Turlock Lake Formation dates to 450,000 to 600,000 years ago, the Riverbank Formation dates to 450,000 to 130,000 years ago, and the Modesto Formation is estimated to be dated between 14,000 and 42,000 years old. Soil in the Project site is dominated by sandy loams of the Whitney and Montpellier series, with smaller amounts of Greenfield and Rocklin sandy loams. Whitney and Rocklin soils are associated with the Turlock Lake Formation and date to the early to middle Pleistocene (1.8 million years ago to 130,000 years ago), Montpelier soils are also associated with the Turlock Lake Formation and date to the early to middle Pleistocene (90,000 to 22,960 years ago), and Greenfield series soils are associated with the lower Modesto Formation and date to the late Pleistocene (130,000 to 15,000 years ago) (Rosenthal and Meyer 2004). Based on the age of the soils and bedrock in the majority of the Project site, the potential for buried pre-contact archaeological deposits in undisturbed portions is low.

The northernmost 0.25 miles of the Project site from the Turlock Main Canal to 450 feet south of the intersection of Lake Road and Hawkins Road overlies Hanford sandy loams (which date to the mid-to-late Holocene) and Tujunga loamy sands (which date from the Latest Holocene to the Historic period). These soils have a high sensitivity based on their age (Rosenthal and Meyer 2004). However, soils in the northern terminus of the Project site have been significantly disturbed by the construction of the canal and agricultural development. The portion of the Turlock Main Canal that intersects the Project site was constructed by 1955. No pre-contact or indigenous resources have been previously recorded within the Project site or within 0.5-mile of the Project site. No pre-contact or indigenous resources were identified during the pedestrian survey. The majority of the Project site is comprised of sandy soils that have been heavily disturbed as part of agricultural or road construction processes. Therefore, the landform, proximity to known archaeological resources, and the history of disturbed soils suggest that the entirety of the Project site has a lessened potential for the presence of pre-contact archaeological resources.

Evidence of historic-era settlement and land-reclamation activities have been documented near and within the Project site, however these resources are all built environment resources. A historic aerial and map imagery review did not identify any structures or features previously constructed within the Project site besides the canal recorded and evaluated above. Based on this review, the potential for presence of unrecorded, or previously unknown, historic-era archaeological resources is low.

Therefore, this analysis concludes that the Project site's sensitivity for pre-contact and historic-era archaeological resources is low.

Field Survey

On November 21, 2025, and May 12, 2026, ESA archaeologists performed a pedestrian survey of all areas of proposed ground disturbance within the Project site (area of potential effect [APE]). The pedestrian survey did not identify any surface indications of archaeological deposits. The portion of the Project site not included in the pedestrian survey will be utilized for flood recharge and not subject to Project-related construction and ground disturbance.

Cultural Resources Identified in the Project Site

One built environment resource was identified that intersects the Project site, the Turlock Main Canal. Turlock Main Canal consists of three canal segments totaling 46.86 miles that connect from the start at the pump station just below the La Grange Dam to the east and terminates southwest of Hickman on the west. The first segment, also known as the Upper Main Canal, measures 2.05 miles and connects the La Grange Dam pump station to the eastern end of Dawson Lake. The middle segment, measuring 4.80 miles, connects the western end of Dawson Lake to the eastern end of Turlock Lake. The western segment, the longest of the three, measures 11.82 miles and connects the western end of Turlock Lake to the intersection of this resource with the Ceres Main Canal southwest of Hickman. The APE intersects this westernmost segment of the Canal approximately 2.8 miles west of Turlock Lake.

Three existing studies noted in ESA (2026) (Daly [2009], McMorris and Walters [2005], and Patrick [2016]) have included evaluations of the Turlock Main Canal in the DPR forms and recommended that the resource is not eligible for inclusion in the National Register of Historic Places (National Register). Daly identified the period of significance for the resource as the years between 1887 and 1925 as this was the period between when the construction of the canals began and when the original concrete lining was

installed. Daly recommended that while the resource appeared to be eligible for the National Register under Criterion A for its association with the development of the first public owned irrigation district in California, the resource did not retain sufficient integrity of workmanship, setting, materials, or feeling to convey any potential significance. The evaluations of the resource in the other two studies' (by McMorris and Walters and Patrick) follow Daly's recommendations based on a lack of integrity due to modifications of the resource during maintenance and modernization of the system.

While all of these evaluations focus on the National Register, their argument regarding integrity is transferable to a California Register of Historical Resources (California Register) evaluation. While the Turlock Main Canal is associated with the Turlock Irrigation District, an important utility agency in Stanislaus County, ESA recommends that it does not possess exceptional significance through this association and therefore is not eligible under California Register Criterion 1. There are no persons significantly associated with the Turlock Main Canal under Criterion 2. Nor does the canal represent the distinctive characteristics of a type, period, or method of construction under Criterion 3. And any data potential has already been captured by its repeated recordings under Criterion 4. Following the conclusions of Daly, McMorris and Walters, and Patrick. ESA also finds that the canals have been upgraded to modern standards and lacks sufficient integrity of setting, materials, workmanship, or feeling to convey any potential significance. As such, the Turlock Main Canal is not eligible for listing in the California Register and is not considered a historical resource under CEQA.

Impact Analysis

- a) **No Impact.** CEQA Guidelines Section 15064.5 requires the lead agency to consider the effects of a Project on historical resources. A historical resource is defined as any building, structure, site, or object listed in or determined to be eligible for listing in the California Register of Historical Resources (California Register) or determined by a lead agency to be significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, or cultural annals of California. The following discussion focuses on built environment (architectural and structural) resources. Archaeological resources, including those that are potentially historical resources according to CEQA Guidelines Section 15064.5, are addressed below under issue b).

The Project site contains no structures, nor is adjacent to any built environment resource that qualifies as a historical resource for the purposes of CEQA (i.e., eligible for listing in the California Register of Historical Resources). Therefore, the Project would not have the potential to cause a substantial adverse change to the significance of any built environment historical resource, as defined in Section 15064.5 of the CEQA Guidelines. The Project would not demolish a significant built environment historical resource or alter its physical characteristics, nor would it change elements within the historic setting of such a resource. Therefore, the Project would have no impact on built environment historical resources.

- b) **Less-than-Significant Impact with Mitigation Incorporated.** Archaeological resources can be considered historical resources, according to CEQA Guidelines Section 15064.5, as well as unique archaeological resources, as defined in Public Resources Code (PRC) Section 21083.2(g).

No surface indications of archaeological resources were identified during the pedestrian survey. The results of the CCalC records search indicate that no previously recorded archaeological resources have been identified in or within 0.5 miles of the Project site. The archaeological sensitivity assessment found that the majority of the APE is located in soils that have a very low potential for buried archaeological deposits and that in areas of higher potential, significant disturbance has occurred, decreasing the potential for intact buried deposits to also be low. However, there is the potential for significant archaeological deposits to be present in the Project site. Impacts to these resources from project construction could be significant.

Implementation of **Mitigation Measure CUL-1, Cultural Resources Awareness Training**, and **Mitigation Measure CUL-2, Inadvertent Discovery of Cultural Resources**, would reduce impacts related to archaeological deposits that qualify as historical resources and unique archaeological resources to a less-than-significant level with mitigation through implementation of worker awareness training, and requirements to stop work if archaeological deposits are encountered during ground-disturbing activities.

MM CUL-1: Cultural Resources Awareness Training. Before any ground-disturbing and/or construction activities, an archaeologist meeting or under the supervision of an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards (SOI PQS) for Archeology shall conduct a training program for all construction and field personnel involved in Project-related ground disturbance prior to such personnel conducting any on-site activities. If a Native American tribe has expressed interest in the project via AB 52 or Section 106-related tribal consultation, they shall be invited to participate in the training program. The training shall outline the general archaeological sensitivity of the area and the procedures to follow if an archaeological resource and/or human remains are inadvertently discovered during Project-related activities. This training shall be provided once to each worker involved in ground-disturbing activities before they begin work and shall be documented in training records submitted to the EWD.

MM CUL-2: Inadvertent Discovery of Cultural Resources. If pre-contact or historic-era archaeological resources are encountered during Project implementation, all construction activities within 100 feet shall halt, and a qualified archaeologist, defined as an archaeologist meeting the SOI PQS, shall inspect the find within 24 hours of discovery and notify the EWD of their initial assessment. Pre-European contact archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include building or structure footings and walls, and deposits of metal, glass, and/or ceramic refuse.

If the EWD determines, based on coordination with the SOI PQS archaeologist and a Native American representative (if the resource is pre- contact and a tribal government has requested consultation), that the resource may qualify as a historical resource or unique archaeological resource (as defined in CEQA Guidelines Section 15064.5) or a tribal cultural resource (as defined in PRC Section 21080.3), the resource shall be avoided, if feasible. Consistent with Section 15126.4(b)(3), this may be accomplished through planning construction to avoid the resource; incorporating the resource within open space; capping and covering the resource; or deeding the site into a permanent conservation easement.

If avoidance is not feasible, the EWD shall consult with appropriate Native American tribes (if the resource is pre-contact and a tribal government has requested consultation), and other appropriate interested parties to determine treatment measures to avoid, minimize, or mitigate any potential impacts to the resource pursuant to PRC Section 21083.2, and CEQA Guidelines Section 15126.4. This shall include documentation of the resource and may include data recovery (according to PRC Section 21083.2), if deemed appropriate, or other actions such as treating the resource with culturally appropriate dignity and protecting the cultural character and integrity of the resource (according to PRC Section 21084.3).

- c) **Less-than-Significant Impact with Mitigation Incorporated.** Based on the records searches and survey results, no human remains are known to exist at the Project site. While unlikely, it is possible that human remains could be encountered during construction. In the event that human remains are identified during Project activities, these remains would be required to be treated in accordance with Section 7050.5 of the California Health and Safety Code and Section 5097.98 of the Public Resources Code, as appropriate. Section 7050.5 of the California Health and Safety Code states that, in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the remains are discovered has determined whether or not the remains are subject to the coroner's authority. If remains are of Native American origin, the coroner must notify the Native American Heritage Commission within 24 hours of this identification. The NAHC will identify a Native American Most Likely Descendent (MLD) to inspect the site and provide recommendations for the proper treatment of the remains and associated grave goods.

Implementation of **Mitigation Measure CUL-1, Cultural Resources Awareness Training**, and **Mitigation Measure CUL-2, Inadvertent Discovery of Cultural Resources**, presented above, and compliance with the California Health and Safety Code as prescribed in **Mitigation Measure CUL-3, Inadvertent Discovery of Human Remains**, would reduce impacts to human remains to a less-than-significant level.

MM CUL-3: Inadvertent Discovery of Human Remains. In the event of discovery or recognition of any human remains during construction activities, all such activities within 100 feet of the find shall cease until the County Coroner has been contacted to determine that no investigation of the cause of death is required. Pursuant to Section 7050.5 of the California Health and Safety Code, the NAHC shall be contacted within 24 hours if the Coroner determines that the remains are Native American. The NAHC shall then identify the person or persons it believes to be the most likely descendant from the deceased Native American, who, in turn, would make recommendations for the appropriate means of treating the human remains and any grave goods.

References

- Daly, P. 2009. P-50-000073 DPR Site Record Form Set. Central California Information Center, CSU Stanislaus, Turlock, CA.
- ESA (Environmental Science Associates). 2026c. *Eastside Aquifer Restoration Initiative Project, Cultural Resources Technical Report*. October 2026.

- McMorris, C., and A. Walters. 2005. P-50-001890 DPR Site Record Form Set. Central California Information Center, CSU Stanislaus, Turlock, CA.
- Patrick, M. P. 2016. P-50-000073 DPR Site Record Update. Central California Information Center, CSU Stanislaus, Turlock, CA.
- Rosenthal, J. S., and J. Meyer. 2004. *Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways: Vol III: Geoarchaeological Study, Landscape Evolution and the Archaeological Record of Central California*. Prepared by Far Western Anthropological Research Group, Inc., Davis, CA. Prepared for Caltrans District 10, Stockton.
- USDA (United States Department of Agriculture). 2026. Natural Resources Conservation Service Web Soil Survey, Version 3.4. Accessed May 13, 2026.
<http://websoilsurvey.sc.egov.usda.gov/app/WebSoilSurvey.aspx>.
- Wills, C. J., M. D. O'Neal, P. J. Holland, B. M. Parrish, E. L. Key, and M. P. Delattre. 2002. Preliminary Geologic Map of the Oakdale 30' x 60' Quadrangle, California. Prepared by the California Geological Society.
-

3.2.6 Energy

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than-Significant Impact</i>	<i>No Impact</i>
VI. ENERGY — Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

Environmental Setting

Three energy providers serve Stanislaus County and Merced County: Pacific Gas and Electric (PG&E), Modesto Irrigation District, and TID. All three providers offer a diverse portfolio of renewable and non-renewable sources. At a local level, Stanislaus County consumes a small amount of energy relative to the state with electricity and natural gas usage less than 2 percent of the statewide total (Stanislaus County, 2016). Similarly, Merced County consumes a small amount of state electricity and natural gas usage. According to the California Energy Commission (CEC), in 2024 the County of Stanislaus consumed approximately 5,200 Giga Watt-hours (GWh) of electricity and Merced County consumed 3,699 GWh of electricity in 2024 (CEC 2026).

The proposed Project would be served by TID. TID owns and operates an electricity generation, transmission, and distribution system that serves approximately 240,000 customers within a 662-square-mile service area. TID's service area includes Ceres and Turlock and stretches from the Santa Clara County border in the west to the Tuolumne County border in the east. TID operates 389 miles of transmission lines in Stanislaus and Merced Counties. In 2024, electricity consumption in TID's service area from all sectors totaled 2,310 GWh, and peak consumption in August 2024 was 281 GWh (CEC 2026). TID relies on a mix of power sources including natural gas (40 percent) renewables such as solar and wind (34 percent) and large hydroelectric (26 percent) (TID 2026).

Currently, gasoline is the most commonly used transportation fuel by volume in California, with 97 percent of all gasoline in use by light-duty cars, pickup trucks, and sport utility vehicles (CEC 2025a). According to the CEC, Stanislaus County consumed an estimated 229 million gallons of gasoline in 2024, similar to the 230 million gallons consumed in 2010 and compared to the 197 million gallons consumed in 2020. Merced County consumed an estimated 120 million gallons of gasoline in 2024, compared to 106 million gallons in 2010 and 2020 (CEC 2025b).

Diesel fuel is the second most commonly used transportation fuel by volume in California, with 17 percent of all fuel sales. According to the CEC, nearly all heavy-duty trucks, delivery vehicles, buses, trains, ships, boats and barges, farm equipment, construction equipment, military vehicles and equipment have diesel engines (CEC 2025d). Stanislaus County consumed an estimated 64 million gallons of diesel in 2024, compared to the 36 million gallons consumed in 2010 and the 39 million gallons consumed in 2020 (CEC 2025b). Merced County consumed an estimated 47 million gallons of diesel in 2024, compared to the 45 million gallons consumed in 2010 and the 30 million gallons consumed in 2020 (CEC 2025b).

Impact Analysis

- a, b) **Less-than-Significant Impact.** Energy standards such as the Energy Policy Act of 2005 (U.S. EPA 2025) and the Renewables Portfolio Standard (RPS) (CEC 2025d), promote strategic planning standards intended to reduce the consumption of fossil fuels, increase the use of renewable resources, and enhance energy efficiency. In general, these regulations and policies specify statewide strategies to reduce fuel consumption and increase fuel efficiency and energy conservation. If the Project were to use energy resources in a wasteful manner, it would also conflict with state energy standards.

Project construction would be conducted in a manner consistent with the goals and strategies of state energy standards. A full list of construction equipment anticipated to be used for the proposed Project is included in Chapter 2, *Project Description, Construction Equipment and Schedule*. There would be a temporary increase in fuel demand (gasoline and diesel) that would result from the use of construction equipment and vehicles, haul trips to and from the site, and vehicle trips generated by construction workers commuting to and from the site. Construction activities for the proposed project would last approximately 12 months and were conservatively estimated to begin in July 2028.

Construction activities would use fuel-efficient equipment consistent with state and federal regulations, such as fuel efficiency regulations in CARB's Pavley Phase II standards (CARB 2025); the anti-idling regulation in California Code of Regulations (CCR) Title 13, Section 2485 (13 CCR Section 2485); and fuel requirements for stationary equipment in 17 CCR Section 93115 (concerning the Airborne Toxic Control Measures). Further, in accordance with 13 CCR Sections 2485 and 2449, idling commercial vehicles heavier than 10,000 pounds and off-road equipment exceeding 25 horsepower would be limited to a maximum of 5 minutes. Although the intent of these regulations is to reduce construction emissions, compliance with the anti-idling and emission reduction regulations would also result in fuel savings as a result of using more efficient equipment and through reductions in unnecessary use.

As discussed in Chapter 2, *Project Description*, EWD would operate and maintain the pump station and regulating basin, and schedule diversions with TID. The proposed flow meters at the pump station and turnouts would be electromagnetic and thus would require minimal maintenance. Pump station operation and maintenance activities would require bi-weekly site visits when the system is in operation and would result in minor transportation fuel use; maintenance of the regulating basin would be infrequent and would also require minor amounts of transportation fuel. Overall energy use during operations and maintenance would be less than significant.

The Project components would be powered by electricity, including the three pumps at the proposed pump station. No back up diesel generators are anticipated. TID would supply power to the site which would require a new electrical connection and new power pole at the pump station site. Anticipated electricity consumption at the pump station is approximately 3,700,000 - 5,770,000 kWh/yr assuming the pump station runs at full capacity for 180-280 days. This would not conflict with the long-term RPS goal, as the electricity used on-site would be provided by TID which is required to comply with the RPS (CEC 2025d). When considering implementation of the state RPS program, the proposed Project would not prevent the future use of renewable energy.

The total increase in gasoline, diesel, and electricity used during generally infrequent operations and maintenance activities associated with the Project would result in a minor increase in consumption compared to the approximately 229 million gallons of gasoline and 64 million gallons of diesel consumed in Stanislaus County in 2024, and the 5,200 GWh of electricity used in Stanislaus County in 2024. Similarly, the Project would result in a minor increase in consumption compared to the approximately 97 million gallons of gasoline and 47 million gallons of diesel consumed in Merced County in 2024, and the 3,699 GWh of electricity used in Merced County in 2024, and the 2,310 GWh used by TID in 2024. Therefore, the Project's energy consumption would not constitute an excessive use of energy resources. Additionally, compliance with applicable fuel standards, energy use reduction goals, and the RPS Program discussed above would serve to further reduce permanent operations and maintenance energy consumption associated with the Project.

The proposed Project would be consistent with applicable goals and policies adopted that support increased energy efficiency, and would not result in the wasteful, inefficient, or unnecessary consumption of energy. Therefore, impacts would be less than significant.

References

- CARB (California Air Resources Board). 2025. California Phase 2 Greenhouse Gas Standards. Accessed December 18, 2025. <https://ww2.arb.ca.gov/our-work/programs/greenhouse-gas-standards-medium-and-heavy-duty-engines-and-vehicles/phase2>.
- CEC (California Energy Commission). 2026. Electricity Consumption Dashboard. Accessed June 26, 2026. <https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/california-energy-consumption-dashboards-0https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/california-energy-consumption-dashboards-0>.
- CEC. 2025a. California Gasoline Data, Facts, and Statistics. Accessed on December 18, 2025. Available at: <https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/california-gasoline-data-facts-and-statistics>.
- CEC. 2025b. California Annual Retail Fuel Outlet Reporting (CEC-A15) Results. 2010–2023 CEC-A15 Results and analysis. Accessed December 18, 2025. <https://www.energy.ca.gov/media/3874>.
- CEC. 2025c. Diesel Fuel Data, Facts, and Statistics. Accessed December 18, 2025. <https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/diesel-fuel-data-facts-and-statistics>.
- CEC. 2025d. Renewables Portfolio Standard-RPS. Accessed December 18, 2025. <https://www.energy.ca.gov/programs-and-topics/programs/renewables-portfolio-standard>.
- Merced County. 2012. *2030 Merced County General Plan*. Chapter 7, Public Facilities and Utilities. Accessed May 2026. <https://www.countyofmerced.com/1926/Draft-General-Plan-Draft-Program-EIR>.
- Stanislaus County Planning and Community Development Department. 2016. *Stanislaus County General Plan*. Chapter 1, Land Use Element. Accessed December 13, 2025. <https://www.stancounty.com/planning/pl/gp/gp-chapter1.pdf>.

TID (Turlock Irrigation District). 2026. Power Mix. Accessed June 26, 2026.
<https://www.tid.org/power/power-mix/>.

U.S. EPA (United States Environmental Protection Agency). 2025. Summary of the Energy Policy Act.
42 USC Section 13201 et sec. (2005). Accessed December 18, 2025. <https://www.epa.gov/laws-regulations/summary-energy-policy-act>.

3.2.7 Geology and Soils

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than-Significant Impact</i>	<i>No Impact</i>
VII. GEOLOGY AND SOILS — Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

Environmental Setting

The Turlock Subbasin covers two major geomorphic provinces: the Great Valley and the lower foothills of the Sierra Nevada geomorphic province (Todd Groundwater et al. 2024). The most prominent area of the subbasin is in the San Joaquin Valley portion of the Great Valley geomorphic province in the flat, lowland center, which transitions into the low rolling foothills of the Sierra Nevada beneath the central portion of ETSGSA. The area is underlain by a thick sequence of sedimentary deposits that range in age from Jurassic through Quaternary with major geologic formations including the Basement Complex, Ione Formation, Valley Springs Formation, Mehrten Formation, Turlock Lake Formation, Modesto Formation, and Riverbank Formation (Stanislaus County 2016, Todd Groundwater et al. 2024). The Basement Complex consists of igneous and metamorphic rock. The Ione Formation consists of sandstone and conglomerate, and the Valley Springs Formation is mainly rhyolitic sandstone, siltstone, and claystone. The Mehrten Formation consists of sands, clays, conglomerate, sandstone, siltstone, claystone and volcanic tuff and mudflow deposits. The Turlock Lake, Modesto and Riverbank Formations consist of alluvial, riverbank and terrace deposits (Merced County 2012, Todd Groundwater et al. 2024).

There is only one active fault identified in Stanislaus and Merced counties by the Alquist-Priolo Earthquake Fault Zoning Act: the Ortigalita Fault (CDC 2025a and b). This fault is located along the

western quarter of Merced County within the Coast Range Mountains. The Ortigalita Fault has not been active within historic times (1,800 years ago to present) (Merced County 2012).

With regard to soils, the Project site located is in the northeastern San Joaquin Valley where valley-fill sediments overlie consolidated, westward-dipping sedimentary units and basement rock of the Sierra Nevada. Older units crop out in the eastern Subbasin and dip west into the San Joaquin Valley below younger units. The United States Department of Agriculture (USDA) soil data shows that the eastern Turlock Subbasin is widely covered by low permeability surficial zones, generally referred to as “hardpan” with the exception of low-lying areas along the Merced River and smaller drainages such as Mustang Creek, Sand Creek. These hardpan materials are considered restrictive layers in that they restrict or prevent surface water infiltration and serve to reduce groundwater recharge from precipitation or streamflow (Todd Groundwater 2024).

Impact Analysis

- a) **Less-than-Significant Impact.** As stated previously, one Alquist-Priolo Earthquake Fault Zone exists within Stanislaus County and Merced County (CDC 2025b). This Ortigalita Fault is located in the westernmost portion of both counties and has not been active in recent historic times. Additionally, the fault is located over 40 miles away from any Project component. Therefore, risk of strong seismic ground shaking or ground failure is low. The Project site is not located in an area with high landslide susceptibility as the terrain is generally flat or gently rolling with few topographic features. Given that the proposed Project primarily involves a turnout, pump station, below ground conveyance pipeline, and a regulating basin for water conveyance, it would not expose people or structures to substantial adverse effects related to seismic rupture, strong seismic shaking, seismic-related ground failure or liquefaction, landslides, or other soil-related hazards. Therefore, impacts would be a less than significant.
- b) **Less-than-Significant Impact.** Project construction activities would involve ground-disturbing earthwork, including trenching, excavation, and grading primarily for installation of the pump station, conveyance pipeline, regulating basin, turnouts, road culverts and the re-channelization of Mustang Creek. Excavated soils for pipeline installation would be reused by the Project as pipeline backfill, and earthwork would be balanced. Any excess soil excavated for the regulating basin and Mustang Creek re-channelization would be stockpiled for later use by EWD. These activities could increase the susceptibility of soils to erosion by wind or water and subsequently result in the loss of topsoil if not controlled and managed. As the Project would create over 1.0 acre of ground disturbance, a Stormwater Pollution Prevention Plan (SWPPP) would be developed and implemented as part of the Project in accordance with a National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities (Order 2009-0009-DWQ, NPDES No. CAS000002; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ) (Construction General Permit). The SWPPP would include Best Management Practices (BMPs) designed to control run-on and run-off and prevent soil erosion on the Project site. The BMPs may include watering for dust control, sediment basins, installation of silt fences, sand and gravel bags, straw wattle, fiber rolls, and hydroseeding as needed to control erosion at the Project site including construction staging areas. Implementation of these BMPs and compliance with the enforceable

requirements of the Construction General Permit would ensure that the Project's potential impacts associated with soil erosion and loss of topsoil during construction are less than significant.

- c) **Less-than-Significant Impact.** As discussed above, the Project site is not within a Fault, Liquefaction, or a Landslide Zone (CDC 2025b). Land subsidence occurs when a large portion of land is displaced vertically, usually due to the withdrawal of groundwater, or oil and gas. Some areas of the San Joaquin Valley have experienced substantial amounts of subsidence, in excess of 20 feet over the past 50 years. Stanislaus County is just north of the region of the San Joaquin Valley most severely affected by land subsidence (Stanislaus County, 2016). The East Turlock Subbasin has not experienced substantial land subsidence (Todd Groundwater 2024). The Project would not include dewatering or other construction-phase activities that could exacerbate land subsidence. In fact, by implementing a replenishment water recharge program within the Turlock Subbasin, the Project is designed to enhance sustainable groundwater levels, which may help reduce long-term subsidence risks in the area.

The Project would be designed in accordance with a site-specific geotechnical study and specific design elements of the Project components would ensure the structures associated with the Project are suitable to withstand any potential damage due to unstable soils. Additionally, while the Project is not expected to result in significant impacts related to landslides and subsidence, the site-specific geotechnical investigation would include the analysis of the potential for landslides and subsidence. Therefore, impacts related to landslides and other unstable soils would be less than significant.

- d) **Less-than-Significant Impact.** Expansive soils are soils that possess a “shrink-swell” characteristic, also referred to as linear extensibility. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying; the volume change is reported as a percent change for the whole soil. This property is measured using the coefficient of linear extensibility (COLE) (NRCS 2024). The Natural Resources Conservation Service (NRCS) relies on linear extensibility measurements to determine the shrink-swell potential of soils. If the linear extensibility percent is more than 3 percent (COLE=0.03), shrinking and swelling may cause damage to buildings, roads, and other structures (NRCS 2024). Changes in soil moisture can result from rainfall, landscape irrigation, utility leakage, roof drainage, and/or perched groundwater. Expansive soils are typically very fine-grained and have a high to very high percentage of clay. Structural damage may occur incrementally over a long period of time, usually as a result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils.

NRCS Web Soil Survey data indicates that the soils in the Project area have between a 0.2 and 10.6 percent linear extensibility rating, which is considered low to high linear extensibility rating (NRCS 2026). Nonetheless, geotechnical investigations are required to address expansion potential. If site conditions differ from the Web Soil Survey data, measures would be included in the Project geotechnical report that would provide recommendations to address any risk associated with soil expansion. Impacts would be less than significant.

- e) **No Impact.** The Project does not include any components that would require soils adequate for the use of septic tanks or other alternative wastewater disposal system. None of the Project components include the use of septic tanks or an alternative wastewater disposal system, therefore there would be no impact under this criterion.
- f) **Less-than-Significant Impact with Mitigation Incorporated.** Paleontological resources are the fossilized remains of plants and animals, including vertebrates (animals with backbones; mammals, birds, fish, etc.), invertebrates (animals without backbones; starfish, clams, coral, etc.), and microscopic plants and animals (microfossils), and can include mineralized body parts, body impressions, or footprints and burrows. They are valuable, non-renewable, scientific resources used to document the existence of extinct life forms and to reconstruct the environments in which they lived. A significant impact would occur if a project would destroy a unique paleontological resource or site, or a unique geologic feature.

In its “Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources,” the Society of Vertebrate Paleontology (SVP) defines four categories of paleontological potential for rock units: high, low, undetermined, and no potential: **High Potential**, rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources; **Low Potential**, rock units that are poorly represented by fossil specimens in institutional collections, or based on general scientific consensus only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule; **Undetermined Potential**, rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment; and **No Potential**, rock units like high-grade metamorphic rocks (such as gneisses and schists) and plutonic igneous rocks (such as granites and diorites) that will not preserve fossil resources (SVP 2010).

The risks of encountering and/or destroying paleontological resources increase with the amount and depth of ground disturbance associated with a project; ground disturbing activities that would not require mass excavation of soil (i.e., post driven into the ground) would have a minimal impact on paleontological resources, as there would be little to no material to observe. Ground disturbance that includes mass open excavation or situations where excavation spoils may be examined, has a greater impact and an increased likelihood of encountering significant paleontological resources. If ground disturbance and/or excavation associated with the Project encounters and inadvertently damages or destroys significant paleontological resources, this would be a potentially significant impact.

Installation of the proposed conveyance pipeline within existing roadways would require trenching of approximately 6 feet in width and approximately 8 feet in depth. Given that the trenching would occur along existing paved and agricultural roadways that have been previously disturbed, the potential to encounter significant paleontological resources is low. Excavation activities associated with the regulating basin and pump station would be more extensive and require excavation at depths of 9 and 15 feet, respectively. Re-channelization of Mustang Creek would require excavation and the creation of 2:1 channel slopes. While no paleontological resources are known to be present, excavations needed for installing Project components would

have the potential to unearth previously unknown unique paleontological resources. **Mitigation Measure GEO-1, Paleontological Resources Protection**, requires that any unanticipated fossil or other potential paleontological resource discoveries during Project construction be managed through a procedure designed to assess and treat the find as quickly as possible and would reduce potential adverse impacts to less than significant.

MM GEO-1: Paleontological Resources Protection. If subsurface deposits having the potential to be a paleontological resource are discovered during construction, all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist/paleontologist shall be retained to evaluate the significance of the find and shall have the authority to modify the no-work radius as appropriate, using professional judgment. The following actions/notifications shall apply depending on the nature of the find:

- a. If the professional archaeologist/paleontologist determines that the find does not represent a unique paleontological resource, work may resume, and no agency notifications are required.
- b. If the professional archaeologist/paleontologist determines that the find does represent a unique paleontological resource, the archaeologist/paleontologist shall immediately notify the County. The County shall consult on a finding of eligibility and implement appropriate treatment measures for the find. Work may not resume within the no-work radius until the County determines that appropriate treatment measures have been completed sufficient to avoid the loss of a unique paleontological resource.

References

- CDC (California Department of Conservation). 2025a. Earthquake Zones of Required Investigations. Available at: <https://maps.conservation.ca.gov/cgs/informationwarehouse/eqzapp/>. Accessed January 7, 2026
- CDC. 2025b. Fault Activity Map of California. Accessed January 7, 2026. <https://maps.conservation.ca.gov/cgs/fam/>.
- Merced County. 2012. *Draft Merced County General Plan & Draft Program Environmental Impact Report (EIR)*. Chapter 10, Geology, Soils, and Mineral Resources. Accessed May 2026. <https://www.countyofmerced.com/1926/Draft-General-Plan-Draft-Program-EIR>.
- NRCS (Natural Resources Conservation Service). 2024. *National Soil Survey Handbook*. Part 618, Soil Properties and Qualities. Section 618.42, Linear Extensibility Percent.
- NRCS. 2026. Web Soil Survey. Soil Properties and Qualities. Accessed January 7, 2026. <https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>.
- Stanislaus County. 2016. *Stanislaus County General Plan and Airport Land Use Compatibility Plan Update Draft Program Environmental Impact Report*. Adopted April 2016. Accessed January 7, 2026. <https://www.stancounty.com/planning/pl/gp/current/DraftEIR.pdf>.
- Todd Groundwater, et al. 2024. *Turlock Subbasin Revised Groundwater Sustainability Plan (GSP)*. Revised July 2024. Accessed January 14, 2026. <https://turlockgroundwater.org/gsp>.

3.2.8 Greenhouse Gas Emissions

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than-Significant Impact</i>	<i>No Impact</i>
VIII. GREENHOUSE GAS EMISSIONS — Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Environmental Setting

Greenhouse gases (GHGs) trap heat in the atmosphere by preventing some of the solar radiation that hits the earth from being reflected back into space. Some GHGs occur naturally and are needed to keep the earth's surface habitable. However, over the past 100 years, human activities have substantially increased the concentration of GHGs in our atmosphere. This has intensified the natural greenhouse effect, increasing average global temperatures.

Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs) are the principal GHGs. When concentrations of these gases exceed historical concentrations in the atmosphere, the greenhouse effect is intensified. CO₂, CH₄, and N₂O occur naturally and are also generated through human activity. Emissions of CO₂ are largely by-products of fossil fuel combustion, whereas CH₄ results from off-gassing, natural gas leaks from pipelines and industrial processes, and incomplete combustion associated with agricultural practices, landfills, energy providers, and other industrial facilities. N₂O emissions are also largely attributable to agricultural practices and soil management. Other human-generated GHGs include fluorinated gases such as HFCs, PFCs, and SF₆, which have much higher heat-absorption potential than CO₂ and are byproducts of certain industrial processes.

GHG emissions worldwide cumulatively contribute to the global climate change. No single project could generate sufficient GHG emissions on its own to noticeably change the global average temperature. The combination of GHG emissions from past, present, and future projects in the San Joaquin Valley; the entire State of California; across the nation; and around the world contribute cumulatively to the phenomenon of global climate change and its associated environmental effects.

Impact Analysis

a, b) **Less-than-Significant Impact.** The SVJAPCD's GHG guidance (SVJAPCD 2009) is intended to streamline CEQA review by pre-quantifying emissions reductions that would be achieved through the implementation of Best Performance Standards. A project is considered to have a less-than-significant cumulative impact associated with GHG emissions and climate change if it meets any of the following conditions:

1. Comply with an approved GHG reduction plan.

2. Reduce operational GHG emissions by at least 29 percent using any combination of approved operational Best Performance Standards.
3. Reduce operational GHG emissions by at least 29 percent over business-as-usual (BAU) conditions (demonstrated quantitatively).

Because neither Stanislaus County nor Merced County currently have an adopted a GHG reduction plan, Option 1 (listed above) is inapplicable. Options 2 and 3 both require projects to achieve GHG reductions consistent with the goals of Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, to reduce statewide GHG emissions to 1990 levels by 2020 (equivalent to a 29 percent reduction over business-as-usual [BAU] conditions).

However, since publication of SVJAPCD's GHG guidance in 2009, the California Supreme Court has considered the CEQA issue of determining the significance of GHG emissions, in its decision in *Center for Biological Diversity v. CDFW and Newhall Land and Farming* (*Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204). In the Newhall decision, the court questioned a common CEQA approach to GHG analyses for development projects that compared project emissions to the reductions from BAU that would be needed statewide to reduce emissions to 1990 levels by 2020, as required by AB 32. The court upheld the BAU method as valid in theory but concluded that the method was applied improperly in the case of the Newhall project, finding that the project's target was incorrectly deemed consistent with the statewide emission target of 29 percent below BAU for the year 2020. In other words, the court ruled that the percent-below-BAU target developed by the AB 32 Scoping Plan is intended as a measure of the GHG reduction effort required by the state as a whole, and it cannot necessarily be applied to the impacts of a specific project in a specific location.

The California Supreme Court provided some guidance for evaluating the cumulative significance of a proposed land use project's GHG emissions but noted that none of the approaches could be guaranteed to satisfy CEQA for a particular project. The court's suggested "pathways to compliance" can include one or more of the following:

- Use a geographically specific GHG emissions reduction plan (e.g., climate action plan) that outlines how the jurisdiction will reduce emissions consistent with state reduction targets, to provide the basis for streamlining project-level CEQA analysis, as described in CEQA Guidelines Section 15183.5.
- Use the Scoping Plan's BAU reduction goal but provide substantial evidence to bridge the gap between the statewide goal and the project's emissions reductions.
- Assess consistency with AB 32's goal in whole or part by looking to comply with regulatory programs designed to reduce GHG emissions from particular activities. As an example, the court points out that projects consistent with a Senate Bill 375 sustainable communities strategy may need to reevaluate GHG emissions from cars and light trucks.
- Rely on existing numerical thresholds of significance for GHG emissions, such as those developed by an air district.

In light of the Newhall decision and the reliance of SJVAPCD's GHG guidance on the statewide percentage reduction of GHG emissions by 2020, the following assessment of the proposed Project's potential GHG emissions impacts under CEQA relies on the following assessment method:

- Although not strictly applicable to projects within the SJVAB, would the proposed project's emissions exceed the Bay Area Air Quality Management District's (BAAQMD) GHG mass emissions (or "bright line") threshold of 1,100 metric tons of carbon dioxide equivalent per year?

Given the short construction period of approximately 12 months and types and numbers of construction equipment needed, total GHG emissions from Project construction amortized over a 30-year period would be below the BAAQMD significance threshold of 1,100 metric tons of carbon dioxide equivalent per year (Appendix A). Construction of the Project would not result in a cumulatively considerable increase in GHG emissions, and this impact would be less than significant.

As discussed previously, operational GHG emissions for the Project would primarily be generated by on-road vehicular traffic during maintenance trips, as well as from the proposed pump station through use of electric pumps and electromagnetic flow meters. However, employee trips required for periodic maintenance, such as servicing flow meters, would generally be infrequent and minor resulting in negligible GHG emissions over the life of the Project. Additionally, the proposed pump station's three electric pumps would be operated up to approximately 180 days out of any given year depending on availability of replenishment water from the TID Main Canal and would be non-operational the remaining 180 days out of the year. Overall, the proposed electric motors would emit negligible amounts of GHGs over the lifetime of the Project and would not result in a cumulatively considerable increase in GHG emissions. Therefore, operation of the Project would have a less-than-significant impact related to GHG emissions.

References

- AEP (Association of Environmental Professionals). 2016. *Final White Paper Beyond 2020 and Newhall, A Field Guide to New CEQA Greenhouse Gas Thresholds and Climate Action Plan Targets for California*. Accessed October 23, 2025. https://califaep.org/docs/AEP-2016_Final_White_Paper.pdf.
- San Joaquin Valley Air Pollution Control District (SJVAPCD). 2009. *Final Staff Report. Addressing Greenhouse Gas Emissions Impacts under the California Environmental Quality Act*. Accessed November 21, 2025. <https://ww2.valleyair.org/media/mdfm0lsd/1-ccap-final-ceqa-ghg-staff-report-dec-17-2009.pdf>.
- PG&E (Pacific Gas and Electric). 2025. *PG&E's Climate Strategy Report*. Accessed November 21, 2025. <https://www.pge.com/en/about/corporate-responsibility-and-sustainability/taking-responsibility.html>.

3.2.9 Hazards and Hazardous Materials

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than-Significant Impact</i>	<i>No Impact</i>
IX. HAZARDS AND HAZARDOUS MATERIALS — Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code 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?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☒	☐

Environmental Setting

In California, Government Code Section 65962.5 requires the State Water Resources Control Board (SWRCB) and the Department of Toxic Substance Control (DTSC) to maintain regulatory databases listing hazardous materials sites; the list is also referred to as the Cortese List. The Cortese List identifies sites with suspected and confirmed releases of hazardous materials to the subsurface soil and/or groundwater. The listed sites can be accessed through the SWRCB's GeoTracker database and the DTSC EnviroStor database. The reporting and statuses of these sites change as identification, monitoring, and clean-up of hazardous materials sites progress.

A database search of both the EnviroStor and GeoTracker databases identified zero hazardous clean-up sites in the Project site (DTSC 2025; SWRCB 2025). The closest hazardous clean-up site to Project site is the Brock Liquid Transport Merced Spill (T10000001716) at Oakdale Highway and East Avenue, Ballico, which is located approximately 1.2 miles southwest of the southern end of the Project site; however, clean-up of the site has been completed, and the case has been closed since March 2011.

There are three airports in the general Project area: the Modesto City-County Airport (in Stanislaus County, 17 miles west of Project components), the Merced-Castle Airport (in Merced County, 11 miles

southeast of Project components) and the Turlock Municipal Airport (in Merced County, 4 miles southwest of the southernmost Project component). The Modesto City-County Airport is regulated under the Stanislaus County Airport Land Use Compatibility Plan (ALUCP) and the Merced-Castle Airport and Turlock Municipal Airport are regulated under the Merced County ALUCP. Both ALUCPs include noise and safety hazard contours to indicate areas around each airport where a noise or safety hazard exists (Stanislaus County ALUC 2018; Merced County ALUC 2012).

The closest school to the Stanislaus County portion of the Project site is Roberts Ferry Grammar School, located approximately 2 miles northeast of the Project site (Stanislaus County 2025). The closest school to the Merced County portion of the Project site is Ballico-Cressey Elementary School, which is approximately 5 miles southwest of the Project site (Merced County Office of Education 2026).

Within California, fire hazard severity zones are designated by the California Department of Forestry and Fire Protection (CAL FIRE). CAL FIRE uses a five-tiered ranking system to assess the threat to people based on fuel hazard, wildland fire potential, and housing density. The Project site is not located within a state responsibility area (SRA) managed by CAL FIRE; however, the Project site is located within a local responsibility area (LRA). As such, emergency service would be provided by the Stanislaus Consolidated Fire Protection District (SCFPD) or Merced County Fire Department (MCFD), depending on the portion of the Project site. The Project site is generally un-zoned equating to an overall low fire hazard severity (CAL FIRE 2025). In the event of a wildfire, SCFPD or MCFD would be the first responders to the Project site. The closest fire station is SCFPD Station 24, located approximately 6.4 miles northwest of the northern end of the Project site (SCFPD 2025). The closest MCFD station is Ballico Station 62, located approximately 5 miles southwest of the Project site (County of Merced 2026).

Impact Analysis

- a, b) **Less-than-Significant Impact.** Construction activities associated with the Project would require the use of small quantities of hazardous materials such as diesel fuel, gasoline, oils, grease, equipment fluids, cleaning solutions and solvents, lubricant oils, and adhesives. The Project would also include earthmoving activities including grading and trenching.

During construction, contractors handling, storing, or transporting hazardous materials or wastes would comply with hazardous materials regulations, as well as implementation of a SWPPP and BMPs, in compliance with the Construction General Permit which would reduce the risk of accidental release and provide protocols and notification requirements should an accidental release occur.

Any spills of these substances would be cleaned on-site according to the SWPPP and NPDES permitting requirements. The SWPPP would list the hazardous materials (including petroleum products) proposed for use during construction; describe spill prevention measures, equipment inspections, equipment, and fuel storage; describe protocols for responding immediately to spills; and describe BMPs for controlling site run-on and runoff. Additionally, the transportation of hazardous materials is regulated by the U.S. Department of Transportation, the California Department of Transportation, and the California Highway Patrol. Together, federal and state agencies determine driver-training requirements, load-labeling procedures, and container specifications designed to minimize the risk of accidental release.

As discussed in Chapter 2, *Project Description*, EWD would operate and maintain the pump station, pipeline and regulating basin. Flow meters would be electromagnetic and would require minimal maintenance. No hazardous materials would be stored at the pump station or regulating basin. Operation and maintenance activities would be infrequent, and EWD staff would comply with all relevant federal, State, and local laws regarding hazardous material use. Operation and maintenance of the Project would not result in a significant hazard to the public or to the environment through the routine transport, use, or disposal of hazardous materials and would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials. Therefore, the impacts would be less than significant.

- c) **No Impact.** There are no schools located within 0.25 miles of the Project site. Furthermore, fuels, oils, and lubricants used during the proposed construction activities would be handled in accordance with material safety storage and handling protocols and BMPs discussed above that would contain and prevent spills from occurring on the Project site. Therefore, no impact would occur.
- d) **No Impact.** There are no identified hazardous material sites located within the Project site (DTSC 2026; SWRCB 2026). The Project would not be located on a hazardous materials site. There would be no impact under this criterion.
- e) **No Impact.** The nearest public airport to the Project site is the Turlock Municipal Airport located approximately 3.3 miles to the southwest. The Project is not located within an airport land-use plan or within 2 miles of a public airport or public use airport. No impact would occur.
- f) **Less-than-Significant Impact.** During construction, there would be up to 40 workers traveling to the Project site on a temporary basis resulting in minimal impacts to traffic flows. Temporary road closures would take place during the installation of the proposed conveyance pipeline along Hawkins Road, Bledsoe Road and local farm roads. The selected contractor would prepare and submit traffic control plans for review and approval by Stanislaus and Merced counties and ensure proper road detours are established to maintain local area access. Additionally, roadways would be restored to pre-project conditions following the completion of construction.

During the operation and maintenance phase, EWD would operate and maintain the pump station and schedule diversions with TID. Electromagnetic flow meters would require minimal maintenance. Operations and maintenance activities at the pump station would occur bi-weekly during periods of operation, requiring one employee vehicle trip. Therefore, there would not be a permanent substantial increase in the number of people working or residing at or near the Project site resulting in impairment of an emergency response or evacuation plan.

With approval of the traffic control plans and implementation of any conditions required by Stanislaus and Merced counties to reduce disruption and ensure emergency access, the Project would not significantly impair implementation of or physically interfere with any adopted emergency response plan or emergency evacuation plan. Closure of roads during conveyance pipeline construction would be short-term, and due to the agricultural nature of the area, there are many roadways and access roads in the area that can serve as alternative routes should an emergency occur during closure. Impacts related to emergency access would be less than significant.

- g) **Less-than-Significant Impact.** The Project would construct a new pump station and approximately 34,900 feet of pipeline to deliver TID replenishment water to agricultural lands south of the TID Main Canal. The pump station would be powered by three pumps with electric motors and require a new TID electrical connection from Lake Road to the pump station site within the existing Lake Road alignment. Construction activities would take place on existing agricultural lands and along existing access roads; operation and maintenance would be coordinated by EWD and would generally be infrequent. Other ongoing on-site activities (i.e., agricultural activities) would not change with the Project.

The Project site is not located within an SRA managed by CAL FIRE; however, the Project site is located within a LRA, as such, emergency service would be provided by the SCFPD and MCFD. The Project site is generally un-zoned equating to an overall low fire hazard severity (CAL FIRE 2025). In the event of a wildfire, SCFPD or MCFD would be the first responders to the Project site. The closest fire station is Station 24, located approximately 6.4 miles northwest of the northern portion of the Project site.

The Project site is located in a rural area; however, rural roadways such as Hawkins Road and Bledsoe Road provide access throughout the area. Rural roads are generally less congested than urban roads, and emergency responders would be able to quickly respond in the event of an emergency. Additionally, the agricultural lands which constitute the Project area have a network of unimproved agricultural roads which would provide access to emergency service providers in the event of a fire; additionally, these lands are generally at low risk of wildfire themselves. Therefore, the Project would not significantly increase the exposure of people or structures to wildland fires, and the impact would be less than significant.

References

- CAL FIRE (California Department of Forestry and Fire Protection). 2025. Find your Fire Hazard Severity Zone (FHSZ). Accessed November 5, 2025. <https://experience.arcgis.com/experience/5065c998b4b0462f9ec3c6c226c610a9>.
- County of Merced. 2026. Fire Department. <https://www.countyofmerced.com/3883/Fire-Department>.
- DTSC (Department of Toxic Substance Control). 2025. GeoTracker. Accessed December 22, 2025. <https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=Sacramento>.
- Merced County ALUC (Merced County Airport Land Use Commission). 2012. *Merced County Airport Land Use Compatibility Plan*. Adopted June 21, 2012. Merced, CA. Prepared by Mead & Hunt, Inc., Santa Rosa, CA, in association with Mintier Harnish.
- Merced County Office of Education. 2026. School districts. <https://www.mcoe.org/schools/school-districts>.
- SCFPD (Stanislaus Consolidated Fire Protection District). 2025. Stanislaus Consolidated Fire Protection District [Home Page], Accessed December 3, 2025. <https://www.scfpd.us>.
- Stanislaus County. 2018. *Stanislaus County Airport Land Use Compatibility Plan*. Adopted October 6, 2016; amended November 15, 2018. Prepared by Stanislaus County Planning and Community Development Department. Modesto, CA.

Stanislaus County. 2025. Stanislaus County Office of Education [Districts and Schools Page]. Accessed December 3, 2025. <https://www.stancoe.org/about/districts-schools>.

SWRCB (State Water Resources Control Board). 2025. EnviroStor. Accessed December 22, 2025. <https://www.envirostor.dtsc.ca.gov/public/map/?myaddress=Sacramento&tour=True>.

3.2.10 Hydrology and Water Quality

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than-Significant Impact</i>	<i>No Impact</i>
X. HYDROLOGY AND WATER QUALITY — Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i) result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv) impede or redirect flood flows?	☐	☐	☒	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

Environmental Setting

The Project area lies within the East Turlock Subbasin and Middle San Joaquin-Lower Merced- Lower Stanislaus Watershed which is part of the larger San Joaquin River Watershed. This watershed drains an extensive region of agricultural lands and managed water infrastructure, both of which influence surface-water flows, groundwater recharge, and regional water quality. Runoff from the Sierra Nevada feeds the major rivers in the system, transporting water through a highly cultivated and hydrologically modified landscape. The Project area is surrounded by intensively farmed land and shaped by a combination of natural hydrologic features and engineered water delivery systems. Key hydrologic influences include the Tuolumne River, Turlock Lake, and the Merced River.

The Tuolumne River, a major tributary of the San Joaquin River, provides regulated flows that support a variety of beneficial uses including agricultural and municipal beneficial uses (RWQCB 2019), while Turlock Lake, operated by the TID, serves as a central reservoir and distribution point for irrigation water. In addition to these major features, the area is interlaced with man-made irrigation channels that convey water from Turlock Lake to surrounding agricultural fields. Previously natural streams and channels have been artificially configured to deliver surface runoff to the various fields within the region. These channels, along with shallow swales formed by land grading and runoff patterns, contribute to localized

surface drainage and seasonal hydrologic connectivity. While these features may exhibit flow during irrigation or storm events, they are typically dry outside of peak water use periods.

Surface Water

Surface water features in the Project area include the TID Main Canal, Sand Creek, Mustang Creek and Mustang Lake. TID diverts water from Don Pedro Reservoir into the TID Upper Main Canal at La Grange Diversion Dam in accordance with pre- and post-1914 flow and storage water rights (Todd Groundwater, et al. 2024). Diversions flow through the Upper Main Canal to Turlock Lake for temporary storage and irrigation deliveries. Water released from Turlock Lake flows throughout the western subbasin through a network of canals and drains.

TID's conjunctive management program is designed to encourage irrigators to use surface water supplies during periods of surface water availability. Surface water from the Tuolumne River, applied within the TID service area via flood irrigation, is one of the primary sources of groundwater recharge within the Subbasin. During below normal years, groundwater is pumped into TID canals to supplement surface water supplies through the use of rented and drainage wells. More groundwater is used during dry periods when less surface water is available (ESA 2023).

Smaller creeks and streams in the Turlock Subbasin occasionally provide local surface water supply through stormwater runoff primarily for agricultural uses such as livestock watering in the eastern Turlock Subbasin. Specifically, local landowners use this stormwater runoff along three drainageways: Dry Creek, Rouse Lake, and Mustang Creek. Runoff from Sand Creek and Peaslee Creek is also used, but to a lesser extent (ESA 2023).

Surface water features within the Project area include Sand Creek and Mustang Creek which are intermittent drainage features that convey stormwater runoff during wet periods. Mustang Creek discharges into Mustang Lake. Mustang Lake serves as a flood control detention basin and provides incidental groundwater recharge through infiltration. Flow in Mustang Creek discharges to the Highline Canal, which is part of TID's irrigation water delivery and flood flow discharge system. A segment of Mustang Creek within Merced County, south of the Project site and between Mustang Lake and the Highline Canal, is designated by the Central Valley RWQCB as water quality impaired (on the Clean Water Act 303(d) list) for a number of constituents including indicator bacteria, nitrate/nitrite, dissolved oxygen, total dissolved solids, and several pesticides (SWRCB 2024).

Groundwater

The Turlock Subbasin lies between the Tuolumne and Merced Rivers and is bounded on the west by the San Joaquin River and on the east by crystalline basement rock of the Sierra Nevada foothills. The northern, western, and southern boundaries are shared with the Modesto, Delta-Mendota, and Merced groundwater subbasins, respectively (ESA 2023). Beneficial uses of the Turlock Subbasin include municipal, small water systems, and domestic water supply; agricultural supply; industrial supply; other potable and non-potable uses; and environmental water uses including groundwater dependent ecosystems, and interconnected surface water habitat (Todd Groundwater, et al. 2024).

The Turlock Subbasin has experienced historical declines due to long-term groundwater pumping, resulting in the implementation of groundwater sustainability programs intended to increase groundwater

recharge and reduce groundwater pumping. As discussed in Section 2.1, *Project Overview*, the proposed Project is a project and management action (Project 12) identified in the Turlock Subbasin GSP intended to support direct and in-lieu groundwater recharge and promote groundwater sustainability.

Various state and local groundwater monitoring programs collect data on groundwater elevations, water quality and other groundwater characteristics. A groundwater quality monitoring network for the Turlock Subbasin was developed for analyzing sustainable management criteria for degraded water quality. That network leverages existing water quality monitoring programs approved by the SWRCB, the agency with primary responsibility for drinking water supply. Currently, that network contains more than 300 wells (Todd Groundwater, et al. 2024). Water quality constituents of concern identified in groundwater within the Turlock Subbasin include naturally-occurring arsenic, uranium, and total dissolved solids (TDS). Anthropogenic-sourced contamination includes nitrate (as N), salinity (TDS), and 1,2,3-trichloropropane (1,2,3-TCP), tetrachlorethylene (PCE) from various agricultural or industrial-related land uses (Todd Groundwater, et al. 2024).

Groundwater level monitoring networks have been developed to observe and document groundwater levels, groundwater in storage, land subsidence, and interconnected surface water. According to the GSP (Todd Groundwater, et al. 2024), although a small amount of land subsidence has occurred east of Delhi and southeast of Turlock, no impacts from land subsidence have been documented to date in the Turlock Subbasin.

Impact Analysis

- a) **Less-than-Significant Impact.** Construction of the Project would involve ground-disturbing earthwork, including earthmoving, trenching and other excavation, grading, and stockpiling. Construction disturbance has the potential to create conditions for increased erosion and sediment runoff from construction areas which could increase turbidity in downstream receiving waters. In addition, the use of construction equipment would have the potential to result in an accidental release of fuels, oils, solvents, hydraulic fluid, and other construction-related fluids to the environment, thereby degrading water quality.

The contractor would be required to comply with the NPDES Construction General Permit for Discharges of Stormwater Associated with Construction Activities (Construction General Permit) from the SWRCB before initiating ground-disturbing activities. Among the permit's conditions would be preparation and implementation of a SWPPP that would identify and require implementation of BMPs to prevent sediment and other construction-related compounds (e.g., fuel, oil) from entering stormwater runoff. Compliance with the NPDES Construction General Permit, including the implementation of BMPs described in the SWPPP, would ensure that Project construction would control and minimize the potential impact of soil erosion and other construction-related pollutants in stormwater runoff. Therefore, potential water quality impacts to downstream surface waters, including Sand Creek and Mustang Creek, associated with construction would be less than significant.

Once construction is completed, Project operation and maintenance activities would not involve activities with the potential to result in significant increases in sediment or other potential

pollutants in storm runoff. As a result, impacts on surface water quality from the Project's operation and maintenance activities would be less than significant.

With regard to groundwater quality, water quality of groundwater is one of the sustainability indicators that is monitored as part of the Turlock Subbasin GSP's implementation activities. While the additional percolation of water on agricultural lands can affect movement of nitrates or other constituents into groundwater, groundwater conditions including groundwater quality would be monitored as part of the GSP's groundwater monitoring network with annual reporting to California Department of Water Resources. Any follow up management actions related to recharge and groundwater quality would be implemented to ensure protection of groundwater quality and beneficial uses, including coordination with the Central Valley RWQCB, as needed. Impacts would be less than significant.

- b) **No Impact.** The Project would contribute to sustainable groundwater management in the Turlock Subbasin through direct recharge and in-lieu groundwater recharge using replenishment water provided by TID. During the irrigation season, replenishment water delivered through this Project would be used to offset demand for groundwater pumping and provide in-lieu recharge benefits to the Subbasin. During the non-irrigation season, replenishment water would be infiltrated via MAR application or through recharge basins to provide direct recharge benefits to the Subbasin. As noted in the GSP (Todd Groundwater, et al. 2024), the Project is expected to benefit sustainability indicators of the GSP including groundwater levels, groundwater storage, land subsidence, and interconnected surface water. Thus, there would be no adverse impacts associated with groundwater supply and groundwater recharge as listed under this criterion.
- c.i-iv) **Less-than-Significant Impact.** The Project would not create substantial new impervious surfaces nor substantially alter the existing drainage pattern in the area. TID replenishment water would be pumped from the TID Main Canal through a conveyance pipeline to agricultural areas to the south. The conveyance pipeline would be buried, backfilled, and the ground surface restored to pre-project conditions. The regulating basin, which is designed to capture and store operational fluctuations in pipeline deliveries, would be designed, maintained and operated to retain and manage water within its footprint, and would reduce overall water loss to the system, resulting in more conservative use of existing water deliveries. The basin would be unlined and would not substantially increase impervious surfaces resulting in increased runoff in the Project area.

The re-channelization of Mustang Creek would be constructed and operated in accordance with hydrologic and hydraulic studies and engineering design plans that would ensure the velocity and volume of flow through the channel would not increase the rate or amount of surface runoff in a manner which would increase erosion or result in flooding on- or offsite. At the proposed pump station site, stormwater generated on-site would be collected in properly sized drain inlets and a below ground storm drain that would outlet into an existing sump that is used to pump stormwater into Rouse Lake.

While the Project involves the movement of water within the new pipeline, creek channels and beneath road crossings, the Project would not alter the existing drainage patterns in a manner that would have the potential to result in substantial erosion. TID water would not be diverted from

the TID Main Canal for replenishment during storm events and would thus not contribute to potential flooding within the Project site and Project area, nor cause other adverse effects associated with flood flows. Additionally, the proposed culverts at the Sand Creek crossings at E. Keyes Road and Hawkins Road would be properly designed to alleviate and prevent flooding.

Operation of the Project would not result in a discharge to an off-site storm drain system. With implementation of standard BMPs during construction and implementation of approved engineering design plans, the Project would not increase runoff volumes, exceed the capacity of existing drainage facilities nor increase pollutants in stormwater runoff. Impacts associated with the alteration of drainages, redirection of flood flows, and potential increases in pollutants in runoff during construction and operation would be less than significant.

- d) **Less-than-Significant Impact.** The Project is not located in a tsunami, seiche zone, or flood hazard zone; therefore, there is no risk of release of pollutants due to project inundation in these zones. Construction would not obstruct flood flows or reduce flood storage capacity of local drainages and Mustang Lake. Use of Mustang Creek for conveyance would be managed within the capacity of the channels and Mustang Lake for conveyance of replenishment water during non-storm events. The Project would not expose people or structures to increased flood hazards or result in downstream flooding impacts. Impacts would be less than significant.
- e) **Less-than-Significant Impact.** As described above under checklist items a) and b), the Project would comply with the NPDES Construction General Permit, including the implementation of BMPs described in the SWPPP to prevent water quality pollutants such as silt, sediment, hazardous materials, and construction-related fluids from entering receiving waters from Project site stormwater runoff during construction. The Project would not be expected to impact beneficial uses of receiving waters identified in the Central Valley Region Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin (RWQCB 2019).

The Project would utilize TID replenishment water for in-lieu and direct groundwater recharge within the Turlock Subbasin. Groundwater sustainability indicators including groundwater levels, groundwater storage, land subsidence, groundwater quality and interconnected surface waters would be monitored by the ETSGSA and others within the large groundwater monitoring network associated with the GSP, and actions would be taken as needed to ensure minimum thresholds for groundwater sustainability are maintained.

The Project would be constructed and operated by EWD in accordance with the goals of the Turlock Subbasin GSP. As noted in the GSP (Todd Groundwater, et al. 2024), California drinking water maximum contaminant levels (MCLs) were set as the minimum thresholds for groundwater quality sustainability and are considered protective with respect to the avoidance of undesirable results. By protecting drinking water quality, the long-term quality and quantity of useable groundwater for all beneficial uses would be preserved. In setting minimum thresholds for degraded water quality, GSP regulations require that GSAs consider local, state, and federal water quality standards applicable to the Subbasin (354.28(c)(4)). The MCLs are also consistent with the local standards and water quality objectives in the Central Valley Region Basin Plan. Therefore, the Project would not conflict with or obstruct implementation of a water quality

control plan or sustainable groundwater management plan, and this impact would be less than significant.

References

- RWQCB (California Regional Water Quality Control Board, Central Valley Region). 2019. *Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and San Joaquin River Basin*. Revised February 2019. Accessed April 20, 2026.
https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201902.pdf.
- SWRCB (California State Water Resources Control Board). 2024. Final 2024 California Integrated Report (Clean Water Act Section 303(d) List/305(b) Report). Approved by U.S. EPA December 13, 2024. Available at:
https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/2024-integrated-report.html. Accessed April 20, 2026
- ESA (Environmental Science Associates). 2023. *Turlock Subbasin Groundwater Sustainability Plan Program Environmental Impact Report, Consolidated Final*. March 2023.
- Todd Groundwater, et al. 2024. Turlock Subbasin Revised Groundwater Sustainability Plan (GSP). Revised July 2024. Available at: <https://turlockgroundwater.org/gsp>. Accessed on January 14, 2026.
-

3.2.11 Land Use and Planning

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than-Significant Impact</i>	<i>No Impact</i>
XI. LAND USE AND PLANNING — Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

Environmental Setting

Stanislaus County contains a large portion of productive and potentially productive agricultural land. The County economy is largely dependent on agriculture (Stanislaus County 2016). The portion of the Project site in Stanislaus County has a zoning designation of General Agricultural 40 Acre (General AG 40 Acre) (Stanislaus County 2025). Agricultural land is similarly the largest County land use designation by area in Merced County (Merced County 2012). The portion of the Project site within Merced County has a zoning designation of Exclusive Agricultural (A-2) (Merced County GeoStack 2026).

Impact Analysis

- a) **No Impact.** The proposed Project involves the construction of a turnout of the TID Main Canal, a pump station, regulating basin as well as 34,900 linear feet of below ground conveyance pipeline primarily within the paved public roadway right of way and agricultural farm roads. The Project would not include any components that would result in the division of existing residential communities. There would be no impact under this criterion.
- b) **No Impact.** The portion of the Project site in Stanislaus County is designated as General AG 40 acre (Stanislaus County 2016). The General AG 40 land use designation allows for agricultural uses and other similar or compatible uses. The portion of the Project site in Merced County is designated as A-2 (Merced County GeoStack 2026). The construction of the conveyance pipeline would take place along Hawkins Road, Bledsoe Road, and existing farm roads, and would not convert or disrupt ongoing agricultural practices. The regulating basin would be constructed on fallowed agricultural land to support conveyance of replacement water for groundwater recharge. The Project supports long-term agricultural viability through enhanced groundwater sustainability without changing the land from active agricultural use. Therefore, the Project would not interfere with existing land uses and would not conflict with applicable Stanislaus County and Merced County land use and zoning policies. No impact would occur under this criterion.

References

Merced County. 2012. *2030 Merced County General Plan*. Part II–3 land use (draft).
<https://www.countyofmerced.com/1926/Draft-General-Plan-Draft-Program-EIR>.

Merced County GeoStack. 2026. *Dataset 16c9cca785bd4ba0baa0a775cd1d75df_0*. ArcGIS Open Data Portal. https://geostack-mercedcounty.opendata.arcgis.com/datasets/16c9cca785bd4ba0baa0a775cd1d75df_0/explore?location=37.186179%2C-120.651772%2C10

Stanislaus County. 2025. Public Inquiry Map. Accessed December 18, 2025. <https://stancounty-gis.maps.arcgis.com/apps/webappviewer/index.html?id=cde022e7ffe845f690a6a8e19322ceac>.

Stanislaus County Planning and Community Development Department. 2016. *Stanislaus County General Plan*. Chapter 1, Land Use Element. Accessed December 18, 2025. <https://www.stancounty.com/planning/pl/gp/gp-chapter1.pdf>.

3.2.12 Mineral Resources

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than- Significant Impact</i>	<i>No Impact</i>
XII. MINERAL RESOURCES — Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

Environmental Setting

Stanislaus County contains key minerals that are commercially excavated for use as construction aggregates. These aggregates primarily consist of sand and gravel. These resources are found largely in flood plains of rivers and streams (Stanislaus County 2016). Mineral resources of Merced County are primarily sand and gravel (Merced County 2013).

Impact Analysis

- a, b) **No Impact.** The Project site is not located within an area classified as a significant mineral resource by the State Geologist, and no active mines are present within the site (CDC 2016; USGS 2024). Additionally, the U.S. Geological Survey does not identify a potential mineral resource in the Project vicinity, so the Project would not preclude access to or interfere with the potential recovery of this resource. Therefore, the Project would not result in the loss of availability of a known mineral resource, and there would be no impact under this criterion.

References

- CDC (California Department of Conservation). 2016. Division of Mines Reclamation Interactive Map. Accessed November 28, 2025. <https://maps.conservation.ca.gov/mol/index.html>.
- Merced County. 2013. *2030 Merced County General Plan*. Accessed May 21, 2026. <https://www.countyofmerced.com/DocumentCenter/View/6766/2030-Merced-County-General-Plan?bidId=>.
- Stanislaus County Planning and Community Development Department. 2016. *Stanislaus County General Plan*. Chapter 1, Land Use Element. Accessed December 1, 2025. <https://www.stancounty.com/planning/pl/gp/gp-chapter1.pdf>.
- USGS (United States Geological Survey). 2025. Mineral Resources Data System Map. Accessed November 28, 2025. <https://mrdata.usgs.gov/mrds/map-graded.html#home>.

3.2.13 Noise

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

Environmental Setting

Noise Terminology

Sound is mechanical energy transmitted by pressure waves through a medium such as air, while noise is defined as unwanted sound. Sound pressure level is measured in decibels (dB), with 0 dB corresponding roughly to the threshold of human hearing and 120 to 140 dB corresponding to the threshold of pain.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements.

When a new noise is introduced to an environment, the human reaction can be predicted by comparing the new noise to the ambient noise level, which is the existing noise level comprised of noise from all sources in a given location. In general, the more a new noise exceeds the ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur (Caltrans 2013).

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived.
- Outside of the laboratory, a 3 dB change is considered a just-perceivable difference.

- A change in level of at least 5 dB is required before any noticeable change in human response would be expected.
- A 10 dB change is subjectively heard as approximately a doubling in loudness and can cause an adverse response.

The perceived increases in noise levels described above are applicable to both mobile and stationary noise sources. These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion; hence, the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise exposure is a measure of noise over a period of time. Noise level is a measure of noise at a given instant in time. Community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and atmospheric conditions. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single-event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual receptor. These successive additions of sound to the community noise environment vary the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts.

This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

L_{dn}: A 24-hour day and night A-weighted noise exposure level, which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night (“penalizing” nighttime noises). Noise between 10 p.m. and 7 a.m. is weighted (penalized) by adding 10 dB to take into account the greater annoyance of nighttime noises.

CNEL: The Community Noise Equivalent Level (CNEL); similar to L_{dn}, the CNEL adds a 5 dB “penalty” for the evening hours between 7 p.m. and 10 p.m. in addition to a 10 dB penalty between the hours of 10 p.m. and 7 a.m.

L_{eq}: The energy-equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L_{eq} is the constant sound level, which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

L_{max}: The instantaneous maximum noise level for a specified period of time.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 to 7.5 dBA per doubling of distance from the source, depending on the topography

of the area and environmental conditions (e.g., atmospheric conditions and noise barriers, vegetative or manufactured). Widely distributed noise, such as a large industrial facility spread over many acres or a street with moving vehicles (known as a *line source*), would typically attenuate at a lower rate, approximately 3 to 4.5 dBA each time the distance doubles from the source, which also depends on environmental conditions (Caltrans 2013). Noise from large construction sites exhibits characteristics of both point and line sources; therefore, attenuation will generally range between 4.5 and 7.5 dBA each time the distance doubles.

Vibration Terminology

As described in the Federal Transit Administration's (FTA) Transit Noise and Vibration Impact Manual, ground-borne vibration can be a serious concern for nearby neighbors, causing buildings to shake and rumbling sounds to be heard (FTA 2018).

Several different methods are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal, which is measured in inches per second. The PPV is most frequently used to describe vibration impacts on buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to express RMS. The decibel notation acts to compress the range of numbers required to describe vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration assessment include structures (especially older masonry structures), people who spend a lot of time indoors (especially residents, students, the elderly and sick), and vibration-sensitive equipment such as hospital analytical equipment and equipment used in computer chip manufacturing.

The effects of ground-borne vibration include the movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for most projects, with the occasional exception of blasting and pile-driving during construction, which would not occur under the Project. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by only a small margin.

Existing Conditions

The noise environment in the area surrounding the Project site is characterized by TID irrigation canal, rural public roadways, private farm roads, and agricultural lands. It includes low-volume traffic noise passenger vehicles, large trucks, and agricultural equipment. The U.S. Environmental Protection Agency estimates that residents of rural or other non-urban areas are exposed to outdoor ambient noise levels ranging from 35 to 50 dBA Ldn (EPA 1974). Because the area surrounding the Project site can be categorized as a rural or other non-urban area, it is assumed that ambient noise levels would range between 35 and 50 dBA Ldn.

Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication, and can cause physiological and psychological stress and hearing loss. Given these effects, some land uses are

considered more sensitive to ambient noise levels than others. In general, residences, schools, hospitals, and nursing homes are considered to be the most sensitive to noise. Places such as churches, libraries, and cemeteries (where people tend to pray, study, and/or contemplate) are also sensitive to noise. Commercial and industrial uses are considered the least noise sensitive.

The Project is located in an area with land uses consisting of rural, agricultural, and grazing areas. The residential receptor nearest to work areas is located approximately 300 feet away from the proposed conveyance pipeline along Bledsoe Road.

Regulatory Framework

Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies. Local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans tend to identify general principles intended to guide and influence development plans; local ordinances establish standards and procedures for addressing specific noise sources and activities.

Federal

Federal Transit Administration Guidelines for Construction

The impact assessment procedures and criteria in the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018) are intended for federally funded mass transit projects, but they are routinely used by projects reviewed by local jurisdictions that have not adopted their own vibration impact standards. FTA has issued guidance on how to assess noise, and vibration impacts from construction-related activities in its manual (FTA 2018). FTA's guidance is designed to be used by project sponsors seeking to evaluate noise and vibration impacts during the environmental review process. The document focuses primarily on operation of transportation projects, but it also provides guidance on the use of heavy machinery and associated sound and vibration levels during construction, including the types of equipment that would be deployed by the Project. FTA's guidance also describes a range of measures for controlling excessive noise and vibration.

Construction Noise

The FTA guidelines identify reasonable criteria for assessing construction noise impacts. According to the manual's Table 7-2, *General Assessment Construction Noise Criteria*, the noise levels at which adverse community reaction could occur for residential land uses in terms of hourly averages are 90 dBA L_{eq} for daytime hours and an 80 dBA L_{eq} for nighttime hours (FTA 2018). FTA recommends that the distances used to estimate construction noise levels at the closest sensitive receptors be based on the middle of the construction site. These noise levels are where adverse community reaction could occur at residential land uses (FTA 2018).

Vibration

FTA and the Federal Railroad Administration have published guidelines for assessing groundborne vibration impacts associated with rail projects, which have been applied by other jurisdictions to other types of projects. FTA's threshold of architectural damage for structures of conventional construction from groundborne vibration is 0.2 in/sec PPV or 94 VdB (dB units of 1 microinch per second). FTA's

threshold for human annoyance at residential uses is 72 VdB for “Frequent Events,” or more than 70 vibration events of the same kind per day.

The FTA-adopted vibration standards are used to evaluate potential building damage impacts related to construction activities. The vibration damage criteria adopted by FTA, shown in **Table 3.2-4**, identify 0.2 in/sec PPV as the level at which potential damage could result to buildings of conventional construction and 0.12 in/sec PPV for buildings extremely susceptible to vibration damage.

**TABLE 3.2-4
CONSTRUCTION VIBRATION DAMAGE CRITERIA**

Building Category	PPV (in/sec)
I. Reinforced-concrete, steel, or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12
Source: FTA, 2018	

State

Vehicle Operations

The State of California establishes noise limits for vehicles licensed to operate on public roads. The pass-by standard for heavy trucks is consistent with the federal limit of 80 dBA. The pass-by standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dBA at 15 meters from the centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanctions on vehicle operators by State and local law enforcement officials.

Vibration

The California Department of Transportation (Caltrans) has developed guidance on addressing vibration issues associated with construction, operation, and maintenance of transportation projects (Caltrans, 2020). **Table 3.2-5** shows the Caltrans criteria for human response to transient vibration.

**TABLE 3.2-5
HUMAN RESPONSE TO TRANSIENT VIBRATION**

Human Response	PPV (inches/second)
Severe	2.0
Strongly Perceptible	0.9
Distinctly Perceptible	0.24
Barely Perceptible	0.035
Source: Caltrans, 2020.	

Local

Table 3.2-6 summarizes the key policies for noise identified in the Stanislaus and Merced County General Plans.

**TABLE 3.2-6
COUNTY GENERAL PLAN POLICIES GOVERNING NOISE**

General Plan	Policies Governing Noise
Stanislaus County	Noise Element; Goal One, Goal Two
Merced County	Chapter Health and Safety Element: Noise; Policies HS-7.5, HS-7.8, and HS-7.12

Stanislaus County Code

Section 10.46.060 of the Stanislaus County Code establishes enforceable noise standards applicable throughout the County. With respect to construction activities, the Code prohibits the operation of construction equipment in a manner that generates an average sound level exceeding 75 decibels (dBA), measured at or beyond the property line of any property containing a dwelling unit, during nighttime hours between 7 p.m. and 7 a.m.

Merced County Code

Section 18.40.050 of the Merced County Code establishes enforceable noise standards applicable throughout Merced County. With respect to construction activities, the Code recognizes that noise levels may be temporarily elevated during construction and establishes requirements to minimize potential noise impacts, particularly in urban areas.

Under this ordinance, construction activities in or adjacent to urban areas are subject to the following noise control provisions:

- Construction hours shall be limited to the daytime hours between 7 a.m. and 6 p.m. daily;
- Operating or permitting the operation of any tools or equipment used in construction, drilling, earthmoving, excavating, or demolition work between 6 p.m. and 7 a.m. on a weekday or at any time on a weekend day, or legal holiday, except for emergency work, or when the sound level exceeds any applicable relative or absolute limit specified in MCC Section 10.60.030 is prohibited; and
- All construction equipment shall be properly muffled and maintained.

Because the Project's construction and operational activities would not result in the development of a new noise-sensitive land use as defined by the Stanislaus or Merced County General Plan, the FTA's recommended daytime construction noise threshold of 90 dBA L_{eq} and the CEQA guidelines are used to assess Project noise impacts.

Impact Analysis

a) Less-than-Significant Impact

Construction

Project construction would result in temporary increases in ambient noise levels. Construction would occur over a period of approximately 12 months. Onsite construction activities would require the use of heavy construction equipment (e.g., excavators, loaders, graders, scrapers, etc.) that would generate varying noise levels. The operation of each piece of equipment would not be constant throughout the day, as equipment would be turned off when not in use. Over a typical workday, the equipment would be operated at different locations, and all the equipment would not operate concurrently at the same location on the Project site.

Construction noise levels have been estimated using typical equipment source noise levels suggested in the Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM) and based on the type of construction equipment that are proposed to be used. To quantify construction-related noise exposure that would occur at the nearest sensitive receptor, it was assumed that the two loudest pieces of construction equipment would operate concurrently at the closest location of the Project sites to the nearest sensitive receptor location.

The estimated L_{max} and L_{eq} for each of the two loudest pieces of equipment that would be used for Project construction, and the combined L_{eq} noise level for the two loudest pieces of construction equipment at the closest sensitive receptor location (300 feet) are presented in **Table 3.2-7**. Using FTA methodology for noise evaluation, at this distance, simultaneous operation of the two noisiest equipment likely to be used for construction would result in noise level of 67.8 dBA L_{eq} , much less than the FTA's recommended daytime construction noise threshold of 90 dBA L_{eq} .

TABLE 3.2-7
PROJECT CONSTRUCTION NOISE LEVELS

Type of Equipment	Distance to Closest Sensitive Receptor	Equipment L_{max} at 50 feet (dBA)/Usage (%)	Equipment L_{eq} at Receptor (dBA)	Combined L_{eq} at Sensitive Receptor (dBA)
Grader	300 feet (Residence)	85.0/40	65.5	67.8
Scraper		83.6/20	64.0	

Notes: L_{max} = maximum instantaneous noise level; L_{eq} = the equivalent sound level; dBA = A-weighted decibels

Source: Table compiled by ESA in 2025 based on Federal Highway Administration, 2008. FHWA Roadway Construction Noise Model, Version 1.1, December 2008.

Neither Merced nor Stanislaus County establish a quantitative noise standard applicable to construction activities in their General Plan Noise Elements or County Codes. However, Merced County Policy HS-7.5 limits construction activity to normal business hours, while Merced County Code exempts construction noise from the sound level limits in Section 18.40.050, provided that construction occurring in or adjacent to urban areas is restricted to daytime hours between 7 a.m. and 6 p.m., and that all construction equipment is properly muffled and maintained.

The Project proposes construction activities between 7 a.m. and 6 p.m. As a result, construction of the turnouts, pump station, regulating basin, pipeline, channel improvements, and culverts would not result in substantial temporary increases in noise levels during the evening hour that would exceed applicable construction hour limitations.

In addition to on-site construction equipment, the Project would also result in short-term increases in local daytime traffic volumes. The Project would add a maximum of 80 one-way construction-related vehicle trips per day and a minimal number of construction materials delivery trips to area roadways over the construction period. The associated increase in short-term construction vehicular noise levels would not be expected to perceptibly increase noise levels in the vicinity of existing sensitive receptors. For this reason, construction-related traffic would not result in a substantial temporary increase in noise levels.

Operation

The primary source of noise during Project operation would be the onsite pump station to distribute replenishment water from the TID Main Canal to the conveyance pipeline and turnouts at varying locations. The new pump station includes a reinforced concrete sump and three electric motor-driven pumps. As a reference, noise monitoring of two large capacity (200 hp) submersible pumps while operational without the attenuation of an enclosure and considered representative of the proposed Project pumps noise levels indicates a combined steady-state operational noise level of 62 dBA at a distance of 5 feet (ESA 2019). This noise generation corresponds to a noise level of 48 dBA at 25 feet. The additional attenuation with distance that would occur at the nearest sensitive receptor location to the pump station (350 feet away), would be within ambient rural noise levels (EPA 1974). Therefore, the Project's operational noise impact would be less than significant.

- b) **Less-than-Significant Impact.** Vibration can be interpreted as energy transmitted as waves through the ground. These energy waves generally dissipate with distance from the vibration source. Since energy is lost during the transfer of energy from one particle to another, vibration attenuates rapidly with distance. Construction of the Project would not involve the use of vibration-generating equipment, such as pile drivers or vibratory rollers, and there are no existing structures in the immediate vicinity of the project components that could be affected by groundborne vibrations. Additionally, operations and maintenance of the Project would not include any sources of vibration. Therefore, the impact with regard to ground-borne vibration during construction or operations would be less than significant.
- c) **No Impact.** The closest airport to the Project site is the Turlock Municipal Airport, located 3.3 miles southwest of the nearest pipeline construction. The Project would not involve the development of noise-sensitive land uses that would be exposed to excessive aircraft noise. Workers that would construct the Project may be exposed to periodic short-term aircraft overflight noise associated with this airport; however, no Project components are located within the 60 dBA L_{dn} noise contours for the Turlock Municipal Airport (Merced County Airport Land Use Commission 2013). Thus, the Project would not expose people working in the Project area to excessive aircraft-related noise levels. Therefore, there would be no impact.

References

- Caltrans (California Department of Transportation). 2020. *Transportation and Construction Vibration Guidance Manual*. Division of Environmental Analysis, Environmental Engineering, Hazardous Waste, Air, Noise, Paleontology Office. April 2020. Accessed May 2026. <https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf>.
- Caltrans. 2013. *Technical Noise Supplement to the Traffic Noise Analysis Protocol*. Division of Environmental Analysis, Environmental Engineering, Hazardous Waste, Air, Noise, Paleontology Office. September 2013. Accessed May 2026. <https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf>.
- ESA (Environmental Science Associates). 2019 Assessment of Potential Noise Impacts from the Proposed Fowler Pump Station Upgrade in San Jose, California, March 2019.
- FTA (Federal Transit Administration). 2018. *Transit Noise and Vibration Impact Assessment Manual*. FTA Report No. 0123. Prepared by John A. Volpe National Transportation Systems Center. September 2018. Accessed May 2026. https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf.
- FHWA (Federal Highway Administration). 2008. FHWA Roadway Construction Noise Model, Version 1.1. December 8, 2008. Accessed May 2026. https://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/.
- Merced County Airport Land Use Commission. 2012. *Merced County Airport Land Use Compatibility Plan*. Accessed May 2026. https://web2.co.merced.ca.us/pdfs/planning/aluc/alucp_july2012/2012_mer_alucp_entire_document.pdf.
- U.S EPA (U.S. Environmental Protection Agency). 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. March 1974.
-

3.2.14 Population and Housing

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than- Significant Impact</i>	<i>No Impact</i>
XIV. POPULATION AND HOUSING — Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Environmental Setting

The center of the Project site is approximately 9 miles southeast from the city of Waterford and approximately 12.8 miles northeast of the city of Turlock. The Project site area is agricultural and with only a few residences.

Impact Analysis

- a) **No Impact.** The Project would not include any new residential development or other infrastructure that would directly or indirectly induce substantial unplanned population growth in the project area. The Project includes development of infrastructure to deliver TID replenishment water to agricultural areas south of the TID Main Canal for in lieu and direct groundwater recharge to promote groundwater sustainability of Turlock Subbasin. The Project would not induce population growth and there would be no impact under this criterion.
- b) **No Impact.** The Project would not involve the demolition of any existing housing nor the construction of replacement housing elsewhere. Furthermore, the Project site is in a sparsely developed agricultural area and would not cause physical displacement of existing population and housing. The Project would not cause a significant environmental impact due to unplanned or induced population growth and/or displaced population and housing. Therefore, the Project would not necessitate construction of replacement housing elsewhere and there would be no impact.

3.2.15 Public Services

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than- Significant Impact</i>	<i>No Impact</i>
XV. PUBLIC SERVICES —				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:				
i) Fire protection?	☐	☐	☒	☐
ii) Police protection?	☐	☐	☒	☐
iii) Schools?	☐	☐	☐	☒
iv) Parks?	☐	☐	☐	☒
v) Other public facilities?	☐	☐	☐	☒

Environmental Setting

The Stanislaus County portion of the Project site is within the service area of the Stanislaus County Consolidated Fire Protection District (SCFPD). SCFPD serves a territory of 195 square miles and operates six stations; the closest station is Station 24, located approximately 6.4 miles northwest of the Project site. This station is staffed 24/7 with 3 personnel, 2 fire engines and 1 water rescue boat (SCFPD 2025). The Merced County portion of the Project site is within the service area of the Merced County Fire Department (MCFD). MCFD operates 17 fire stations staffed by 110 career personnel. CAL FIRE provides operational staffing and emergency response personnel, while Merced County remains responsible for fire apparatus, equipment, vehicles, facilities, and support staff. The closest station is Ballico Station 62, located approximately 5 miles southwest of the Project site (County of Merced 2026).

The Stanislaus County portion of the Project site is within the service area of the Stanislaus County Sheriff's Office. The nearest Stanislaus County Sheriff Department is located approximately 6.5 miles northwest of the Project site (Stanislaus County 2025b). The Merced County portion of the Project site is within the service area of the Merced County Sheriff's Department (MCSD). MCSD service area encompasses the entire unincorporated area of the county. The closest station is located in Delhi, approximately 10 miles southwest of the Project site (Merced County 2012).

Stanislaus County is comprised of 25 residential, public-school districts.. The closest school to the Stanislaus County portion of the Project site is Roberts Ferry Grammar School, located approximately 2 miles northeast of the Project site (Stanislaus County 2025a). Merced County is comprised of 20 school districts. The closest school to the Merced County portion of the Project site is Ballico-Cressey Elementary School, which is approximately 5 miles southwest of the Project site (Merced County Office of Education 2026).

There are no parks, libraries, hospitals or other public services on or adjacent to the Project site. The closest park is the Turlock Lake State Recreation Area, located approximately 3 miles northeast of the Project site. The closest library is the Waterford Public Library located approximately 6.6 miles northwest of the Project site.

Impact Analysis

- a.i–ii) **Less-than-Significant Impact.** The Project would not introduce new housing or other development which could induce population growth and in turn lead to a need for additional emergency response services. In the event of a fire or emergency within the Project site, it is anticipated that existing fire and police protection services in Stanislaus County and Merced County would be able to sufficiently respond to emergencies within existing equipment and staffing capacities. Therefore, implementation of the Project would not require new fire or police facilities to maintain response ratios, service ratios, or other measures of performance. Impacts would be less than significant.
- a.iii–v) **No Impact.** The Project would not result in an increase in population. As a result, the Project would not lead to the construction of new housing, which could prompt a need for additional school services parks, or other public facilities. Therefore, the Project would have no impact related to the need for additional schools, parks and other public facilities.

References

- Merced County. 2012. *Draft Merced County General Plan & Draft Program Environmental Impact Report (EIR)*. Chapter 17, Public Services. Accessed May 2026. <https://www.countyofmerced.com/1926/Draft-General-Plan-Draft-Program-EIR>.
- Merced County. 2026. Fire Department. <https://www.countyofmerced.com/3883/Fire-Department>.
- Merced County Office of Education. 2026. School Districts. <https://www.mcoe.org/schools/school-districts>.
- SCFPD (Stanislaus Consolidated Fire Protection District). 2025. Stanislaus Consolidated Fire Protection District [Home Page]. Accessed December 3, 2025. <https://www.scfpd.us>.
- Stanislaus County. 2025a. Stanislaus County Office of Education [Districts and Schools Page]. Accessed December 3, 2025. <https://www.stancoe.org/about/districts-schools>.
- . 2025b. Stanislaus County Sheriff's Office [Home Page]. Accessed December 4, 2025. <https://www.scsdonline.com/home>.

3.2.16 Recreation

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than- Significant Impact</i>	<i>No Impact</i>
XVI. RECREATION —				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Environmental Setting

The Project site does not contain recreational facilities nor are there recreational facilities in the vicinity of the Project sites.

Impact Analysis

- a) **No Impact.** The Project involves construction of facilities to support direct and in lieu recharge of TID replenishment water to help address groundwater sustainability in the Turlock Subbasin. The Project would not result in population growth and would not increase the use of any existing neighborhood or regional parks or cause the need for expansion of recreational facilities. Therefore, no impact would occur.
- b) **No Impact.** The Project would not include the construction of new or expansion of existing recreational facilities. Because the Project would not require the construction or expansion of additional recreational facilities, there would be no impact under this criterion.

3.2.17 Transportation

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than- Significant Impact</i>	<i>No Impact</i>
XVII. TRANSPORTATION — Would the project:				
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d) Result in inadequate emergency access?	☐	☐	☒	☐

Environmental Setting

The Project is located in a rural agricultural area in eastern Stanislaus County, with the southern portion extending into Merced County. Roadway access in the vicinity is provided by a network of paved county roads, including Lake Road, Hawkins Road, East Keyes Road, Bledsoe Road and E. Monte Vista Avenue, as well as unpaved and paved private farm roads that serve adjacent agricultural uses. Traffic volumes in the Project area are generally low and primarily consist of agricultural vehicles, local resident traffic, and periodic heavy trucks associated with farm operations. No freeways, major regional transit routes, rail, bicycle or pedestrian facilities are located within the immediate Project area. Pedestrian and bicycle activity in the area is minimal due to the rural setting.

Impact Analysis

- a) **Less-than-Significant Impact.** The Project would result in the temporary addition of Project-related construction vehicles to local roadways over the 12-month construction period. Equipment and materials would be transported to the site on public highways, local roads, and private agricultural access roads, using standard transport vehicles. The Project would require up to 40 construction crews generating up to approximately 40 round trips per day (80 one-way trips per day). Importantly, these trips would be temporary and cease with the completion of construction. The addition of these temporary construction round trips along the paved county roads including Hawkins Road and Bledsoe Road as well as along local agricultural roads would not substantially affect circulation capacity, and therefore, the trips would not substantially affect the capacity of the local roadways.

Temporary road closures would take place during the installation of the proposed conveyance pipeline in Hawkins Road, Bledsoe Road and local agriculture roads. The selected contractor would prepare and submit traffic control plans for review and approval by Stanislaus and Merced counties and ensure proper road detours are established to maintain local area access. Additionally, roadways would be restored to pre-project conditions following the completion of construction.

With approval of the traffic control plans and implementation of any conditions required by Stanislaus and Merced counties to reduce disruption and ensure emergency access, the Project would not significantly impair implementation of or physically interfere with any adopted emergency response plan or emergency evacuation plan. Closure of roads during conveyance pipeline construction would be short-term, and due to the agricultural nature of the area, there are many roadways and access roads in the area that can serve as alternative routes should an emergency occur during closure. Impacts related to emergency access would be less than significant.

Project-specific traffic generated from operation and maintenance of the Project would be infrequent (bi-weekly EWD inspections of the pump station, regulating basin, turnouts), and therefore, would not result in any long-term degradation in operating conditions on local roadways used for the Project. Grower turnouts would be operated and maintained by local landowners resulting in minimal additional road traffic. Therefore, the Project would not cause a substantial increase in traffic relative to existing traffic conditions. Impacts would be less than significant.

Further, the Project would not conflict with adopted policies, plans, or programs related to public transit or alternative modes of transportation as there are no nearby facilities which accommodate alternative modes of travel such as bus routes, bike lanes, or pedestrian infrastructure. Therefore, the Project would not decrease the performance or safety of these facilities, which are sparse within the largely rural Project area. Project activities would not disrupt services along local public transit, bicycle, or pedestrian routes. Therefore, impacts on the local circulation system from construction and operation of the Project would be less than significant.

- b) **Less-than-Significant Impact.** 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. For the Project, worker trips would be conducted in cars and light-duty trucks. Construction-related vehicle trips would not create the potential for conflicting with CEQA Guidelines Section 15064.3 pertaining to VMT. Although excluded from VMT analysis, potential environmental impacts associated with the use of medium- and heavy-duty truck trips are addressed in the *Air Quality*, *Energy*, and *Greenhouse Gas Emissions* sections of this document.

According to the *Technical Advisory on Evaluating Transportation Impacts in CEQA* (OPR 2018), projects that generate fewer than 110 trips per day may be assumed to cause a less-than-significant transportation impact. The Project would require construction crews for approximately 12 months of construction activities. Construction workers could generate an estimated 40 round trips (80 one-way trips) per day. Importantly, these trips would be temporary and limited to the approximately 12-month construction period and therefore would not result in any significant or permanent increase in trip generation or VMT. Project operation and maintenance would require one vehicle trip for bi-weekly maintenance visits during the pump station operational period.

Thus, the generally infrequent operations and maintenance activities would be far below the 110-trip threshold for VMT impacts. Because the Project's construction and operational trips would be below the 110-trip threshold, the Project would not conflict with nor be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b) regarding VMT. Impacts due to a conflict or inconsistencies with CEQA guidelines would be less than significant.

- c) **Less-than-Significant Impact.** The Project would result in trenching along portions of public and private agricultural roads to install pipelines and turnouts; however, these roadways would be restored to pre-Project conditions following installation of the conveyance infrastructure and no alterations would be made to their alignments. The Project would use existing private and public agricultural roads for access to the Project sites and for construction activities. The Project does not include the construction or design of any new roadway infrastructure that would cause a safety risk. The Project would not adversely alter the physical configuration of the existing roadway network serving the area and would not introduce unsafe design features. In addition, the Project would not permanently introduce uses (types of vehicles) that are incompatible with existing uses already served by the area's road system. Therefore, roadway hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) would be less than significant.
- d) **Less-than-Significant Impact.** The Project would temporarily add construction-related vehicles and crew vehicles to the local roadway; however, construction would be short-term lasting approximately 12 months. Additionally, as mentioned above, the Project would result in pipeline trenching along portions of Hawkins Road, Bledsoe Road and private agricultural roads to install pipelines and turnouts. The Project would comply with any conditions included in approved traffic control plans to avoid or reduce potential roadway and circulation impacts during construction. The Project would not make any changes to these roadways nor introduce new structures which would interfere with emergency response access.

Due to the agricultural nature of the area, many alternative roadways and access roads are available which could provide access to emergency responders. Following construction, all roads would be opened and disturbed areas would be restored to pre-Project conditions. Operations and maintenance activities would be infrequent with minimal potential for any affect an emergency response. Impacts associated with inadequate emergency access would be less than significant.

References

OPR (California Governor's Office of Planning and Research). 2018. *Technical Advisory on Evaluating Transportation Impacts in CEQA*. Accessed January 27, 2026. https://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf.

3.2.18 Tribal Cultural Resources

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

Environmental Setting

PRC Section 21080.3.1 requires that agencies formally consult with recognized California Native American tribes during the CEQA process to discuss potential impacts on tribal cultural resources. Prior to the release of a Negative Declaration, Mitigated Negative Declaration, or EIR, the agency must initiate consultation with tribes that are traditionally and culturally affiliated with the geographic area of a proposed project if (1) the tribe requested of the agency, in writing, to be informed through formal notification of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe; and (2) the tribe responds, in writing, within 30 days of receipt of the formal notification of a proposed project and requests consultation with the agency (PRC Section 21080.3.1[b]).

Native American Heritage Commission

The Native American Heritage Commission (NAHC) is a state agency that maintains the Sacred Lands File (SLF), an official list of sites that have cultural and religious importance to California Native American Tribes. To identify areas within the Project Site that may be considered sensitive by local Indigenous tribal groups, the NAHC was contacted on November 14, 2025. The NAHC responded on November 24, 2025, with a negative result.

Consultation Outreach per Public Resources Code Section 21080.3.1

On July 20, 2026, invitation to consult letters pursuant to PRC Section 21080.3.1 (AB 52) were sent to representatives of the following California Native American tribes that have requested to be notified of projects within EWD's service area. Included in the letters were details about the Project and a location map:

- Amah Mutsun Tribal Band

- Northern Valley Yokut/Ohlone Tribe
- Southern Sierra Miwuk Nation
- Tule River Indian Tribe
- Wuksachi Indian Tribe/Eshom Valley Band

No responses to the letters were received.

Impact Analysis

- a) The results of the CCalC records search as described in Section 3.2.5, *Cultural Resources*, indicate that no previously recorded archaeological resources or tribal cultural resources listed or eligible for listing in the California Register of Historical Resources (California Register) or a local register of historical resources are known to exist within the Project site. No tribal representatives provided additional information about tribal cultural resources that may be affected by the Project as a result of the GSA's invitation to consult pursuant to PRC Section 21080.3.1. A review of geologic and soils maps indicate that the Project site has a low sensitivity for buried pre-contact and historic-era archaeological deposits. As discussed in Section 3.2.5, *Cultural Resources*, although not expected, archaeological deposits that may qualify as tribal cultural resources could be encountered during ground-disturbing Project activities. Such resources may be eligible for listing in the California Register or a local register of historical resources, or the lead agency, in its discretion and supported by substantial evidence, could determine the resources to be significant pursuant to the criteria set forth in subdivision (c) of PRC Section 5024.1. Should deposits be encountered during ground-disturbing Project activities, this could result in an adverse change to a tribal cultural resource. Thus, potentially significant impacts related to tribal cultural resources could result from construction of the Project.

Should Native American human remains be encountered during Project excavation, the County Coroner would be required to notify the NAHC as provided in CUL-3, and all applicable state and federal regulations governing the treatment of human remains will be followed.

Implementation of **Mitigation Measures CUL-1, Cultural Resources Awareness Training**, and **Mitigation Measure CUL-2, Inadvertent Discovery of Cultural Resources**, as described in Section 3.2.5, *Cultural Resources*, and compliance with the California Health and Safety Code as prescribed in **Mitigation Measure CUL-3, Inadvertent Discovery of Human Remains**, would ensure that impacts related to any tribal cultural resources that may be encountered during Project excavation would be less than significant.

3.2.19 Utilities and Service Systems

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than-Significant Impact</i>	<i>No Impact</i>
XIX. UTILITIES AND SERVICE SYSTEMS — Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

Environmental Setting

Water supply in the Turlock Subbasin area is provided by two primary sources: surface water from the Tuolumne and Merced rivers, and groundwater pumped from the Turlock Subbasin. Agricultural beneficial uses in ETSGSA rely primarily on groundwater (Todd Groundwater 2024).

Denair CSD, Empire Sanitary District, Grayson CSD, Keyes CSD, Salida Sanitary District, Western Hills, and Westley CSD all provide wastewater collection and sewer services to residences and businesses within their respective service areas across Stanislaus County (Stanislaus County 2016). The unincorporated areas of Merced County are generally served by small community sanitary sewer systems, sometimes broken out even further into sewer collection services and contracted wastewater treatment and disposal (Merced County 2012). PG&E provides electricity to Stanislaus and Merced Counties. Internet providers include AT&T, T-Mobile, and Verizon in Stanislaus and Merced Counties (FCC 2025).

Solid waste sources include residential, commercial, and industrial sectors. Solid waste collection service in the unincorporated areas of Stanislaus County is provided by three franchised solid waste collection companies: Bertolotti Disposal, Gilton Solid Waste, and Turlock Scavenger. The Divert Recovery Facility is the closest permitted active landfill to the Project site and is a solid waste facility that has a 250 tons per day capacity (Cal Recycle 2025a). There are two active solid waste disposal-landfill facilities in Merced County: the Highway 59 Disposal site and the Billy Wright Landfill. Both sites are owned and operated by the Merced County Association of Governments Regional Waste Management Authority. Both facilities provide composting and limited resource recovery activities (Merced County 2012).

Impact Analysis

- a) **Less-than-Significant Impact.** The Project would not involve the construction of housing or new staff facilities. Additionally, no new water or wastewater treatment systems would be needed, and the Project would not require new natural gas or telecommunications infrastructure. Existing utilities and infrastructure would remain in place without relocation. While the pump station site includes construction of an on-site storm drain system to accommodate site drainage, no new or expanded stormwater drainage facilities would be needed in the overall Project area resulting from Project site runoff. The Project would not significantly alter the Project area drainage patterns and does not include large increases in impervious surface area that could change surface runoff rates or volumes.

A new electrical service line would be required to service the pump station site and would be run along established roads without exceeding the parameters of previously disturbed agricultural lands, as well as comply with all applicable county codes. The Project would require a temporary road closure and traffic control along Hawkins Road, Bledsoe Road and existing farm roads for installation of the conveyance pipeline; however, this would not impact emergency vehicle access as the traffic control plan would ensure proper road detours are established to maintain local area access. Existing utilities and infrastructure would remain in place without relocation. Impacts related to re-location or construction of new or expanded utilities would be less than significant.

- b) **Less-than-Significant Impact.** The Project would not include the construction of new housing or other development that would require a continuous supply of water, including during normal, dry, and multiple dry years. During construction of the Project, a limited amount of water would be used for dust suppression as needed, and no new or expanded entitlements would be required. Once constructed, the Project would utilize TID replenishment water for direct and in-lieu groundwater recharge of the Turlock Subbasin and contribute to groundwater sustainability. Impacts associated with the availability of water supplies, including during normal, dry, and multiple dry years would be less than significant.
- c) **No Impact.** The Project does not include construction of new housing or other development that would require new or expanded wastewater facilities. Project construction is expected to last approximately 12 months continuously. During project construction, the contractor would provide portable toilet facilities for use by construction workers. During the construction period, wastewater would be properly handled and disposed of in accordance with applicable laws and regulations. Additionally, at the end of the construction period, all portable facilities would be removed. Operation and maintenance of the Project would not require wastewater treatment from a wastewater treatment provider. The Project would have no impact on the capacity of any existing wastewater treatment facilities.
- d) **Less-than-Significant Impact.** Construction of the Project would result in nominal solid waste limited to trash and other construction-related materials. Most solid waste would be generated during the construction phase and would be associated with packaging and discarded materials from construction activities. Long-term operation and maintenance activities would not generate substantial quantities of solid waste, and any solid waste produced would be removed and disposed in compliance with local laws and regulations regarding the recycling of waste. The

closest permitted active landfill and recycling facility is the Divert Recovery Facility in Turlock is located approximately 14.7 miles away from the southern end of the Project site. It has not yet reached capacity (Cal Recycle 2025a) and is available if needed. The Project would not interfere with waste reduction goals, and impacts related to solid waste generation would be less than significant.

- e) **No Impact.** Assembly Bill 939 requires local governments to create waste reduction and recycling policies to ensure waste reduction goals are being met (CalRecycle 2025b). As discussed above, construction waste would be minimal and would be handled and disposed of, or recycled, consistent with management and reduction statutes and regulations related to solid waste. EWD would be responsible for the correct handling and disposal of the minimal accumulation of waste and, similarly, would be required to comply with management and reduction statutes and regulations related to solid waste. By complying with all relevant statutes and regulations related to solid waste management, no impacts would occur.

References

- Cal Recycle (California Department of Resources Recycling and Recovery). 2025a. SWIS Facility/Site Summary. Divert Recovery Facility, Turlock (50-AA-0052). Accessed January 8, 2025. <https://www2.calrecycle.ca.gov/SolidWaste/Site/Summary/5580>.
- Cal Recycle. 2025b. Enforcement. Accessed January 8, 2026. <https://calrecycle.ca.gov/LGCentral/Enforcement/>.
- FCC (Federal Communications Commission). 2025. FCC National Broadband Map. Accessed January 8, 2026. https://broadbandmap.fcc.gov/location-summary/mobile?version=dec2024&lon=-120.389422&lat=36.888377&addr_full=36.888377%2C+-120.389422&zoom=15.00&env=0&tech=tech4g.
- Merced County. 2012. *Draft Merced County General Plan & Draft Program Environmental Impact Report (EIR)*. Chapter 20, Utilities and Service Systems. Accessed May 2026. <https://www.countyofmerced.com/1926/Draft-General-Plan-Draft-Program-EIR>.
- Stanislaus County. 2016. *Stanislaus County General Plan and Airport Land Use Compatibility Plan Update Draft Program Environmental Impact Report*. Adopted April 2016. Accessed January 7, 2026. <https://www.stancounty.com/planning/pl/gp/current/DraftEIR.pdf>.
- Todd Groundwater, et al. 2024. *Turlock Subbasin Revised Groundwater Sustainability Plan (GSP)*. Revised July 2024. Accessed January 14, 2026. <https://turlockgroundwater.org/gsp>.
-

3.2.20 Wildfire

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less-than-Significant Impact</i>	<i>No Impact</i>
XX. WILDFIRE — If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☒	☐
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

Environmental Setting

The majority of the Project site is located in Stanislaus County, east of Montpellier Road (County Highway J9), south of the TID Main Canal and north of the Merced River. The center of the Project site is approximately 9 miles southeast from the city of Waterford and approximately 12.8 miles northeast of the city of Turlock. It is bounded on the west by the paved two-lane Hawkins Road and on the east by Bledsoe Road. The Project would be constructed within Hawkins Road, Bledsoe Road and existing agricultural roads. Surrounding vegetation consists of agricultural crops. Surrounding sparsely developed lands include agricultural infrastructure and structures. The nearest mountain range is Table Top Mountain, approximately 17 miles east of the Project site. The topography of the area is generally flat.

The Project site is not located within an SRA managed by CAL FIRE; however, the Project site is located within a LRA, as such, emergency service would be provided by the SCFPD. The Merced County portion of the Project site is within the service area of the MCFD. The Project site is generally un-zoned equating to an overall low fire hazard severity (CAL FIRE 2025). In the event of a wildfire, either SCFPD or MCFD would be the first responders depending on the location. MCFD's Ballico Station 62 is located approximately 5 miles southwest of the Project site (County of Merced 2026) and SCFPD's closest fire station is Station 24, located approximately 6.4 miles northwest of the northern end of the Project site.

Impact Analysis

- a) **Less-than-Significant Impact.** Implementation of the Project is not anticipated to substantially impair an adopted emergency response plan or evacuation plan or interfere with emergency response access to the Project vicinity. During construction, there would be up to 40 workers traveling to the Project site on a temporary basis resulting in minimal impacts to traffic flows. Temporary road closures would take place during the installation of the proposed conveyance pipeline along Hawkins Road, Bledsoe Road and local agricultural roads. The selected contractor

would prepare and submit traffic control plans for review and approval by Stanislaus and Merced counties and ensure proper road detours are established to maintain local area access. Additionally, roadways would be restored to pre-project conditions following the completion of construction.

The Project does not include the construction of housing or other buildings which would increase the number of people living or working at the Project site resulting in an increase in demand for emergency or evacuation services. Additionally, as discussed previously, operations and maintenance activities would generally be infrequent, resulting in minimal change to baseline traffic conditions. Therefore, there would not generate a permanent substantial increase in the number of people working or residing at or near the Project site which could result in impairment of an emergency response or evacuation plan.

With approval of the traffic control plans and implementation of any conditions required by Stanislaus and Merced counties to reduce disruption and ensure emergency access, the Project would not significantly impair implementation of or physically interfere with any adopted emergency response plan or emergency evacuation plan. Closure of roads during conveyance pipeline construction would be short-term, and due to the agricultural nature of the area, there are many roadways and access roads in the area that can serve as alternative routes should an emergency occur during closure. Impacts related to emergency response plan and emergency evacuation plan would be less than significant.

- b) **No Impact.** The Project site is relatively flat and does not include steep slopes nor the introduction of impervious surfaces that would be susceptible to downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. Further, as the Project site is relatively flat and not near any steep slopes or hillsides, and the Project would not introduce large structures that could affect wind conditions, there would be a negligible effect due to prevailing winds or exacerbated fire risk. Additionally, the surrounding vegetation and land use types have a low potential for fires due to regular irrigation. No impact would occur.
- c, d) **Less-than-Significant Impact.** As discussed above, the Project is not located in an SRA; however, the Project site is located within an LRA is un-zoned equating to a low fire hazard severity (CAL FIRE, 2025). The Project includes construction of pump station powered by electric motors with power supplied by a TID connection. Design and construction of the electrical system would be in accordance with applicable County codes and ordinances.

As the Project would require the installation and maintenance of new infrastructure, wildfire risks could be negligibly increased as a result of temporary construction activities or long-term operations and maintenance. However, the Project does not require the installation of roads, fuel breaks, or emergency water sources, nor does it include the construction of housing or permanent structures for staff.

The Project is also located in a rural area, and as such, population density is low and there are generally few homes in the surrounding area which could be exposed to toxic pollutants from wildfire should it occur. The Project site is relatively flat and does not include steep slopes nor

does the Project include the introduction of impervious surfaces that would be susceptible to downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. Further, as the Project site is relatively flat, not near any mountain ranges, and would introduce no large structures which could affect wind conditions, there would be a negligible effect due to prevailing winds as compared to existing conditions.

In the event of a fire the SCFPD or MCFD would be the first responders to the Project site. The closest SCFPD fire station is Station 24, located approximately 6.4 miles northwest of the northern end of the Project site (SCFPD 2025). The closest MCFD station is Ballico Station 62, located approximately 5 miles southwest of the Project site (County of Merced 2026). As mentioned above, the Project site is located in a rural area; however, it is in close proximity to the City of Waterford and roadways provide access throughout the area. Additionally, as rural roads are generally less congested than urban roads, emergency responders would be able to quickly respond in the event of an emergency. Further, the agricultural lands which constitute the Project area have a network of access roads which would provide access to emergency service providers.

As discussed above, EWD would operate and maintain the pump station and schedule diversions with TID. Flow meters would be electromagnetic and would require minimal maintenance. Any staff would only be on-site temporarily; ongoing surrounding agricultural activities are not expected to change as a result of the Project. There would not be an increase in the number of people working or residing at or near the Project site. Therefore, the Project is not expected to substantially increase exposure of Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire, exacerbate fire risk or result in temporary or ongoing impacts to the environment, or expose people or structures to significant risks due to runoff, post-fire slope instability, or drainage changes. As a result, the impact would be less than significant.

References

- CAL FIRE (California Department of Forestry and Fire Protection). 2025. Find your Fire Hazard Severity Zone (FHSZ). Accessed November 5, 2025. <https://experience.arcgis.com/experience/5065c998b4b0462f9ec3c6c226c610a9>.
- Merced County. 2026. Fire Department. Accessed May 13, 2026. <https://www.countyofmerced.com/3883/Fire-Department>.
- SCFPD (Stanislaus Consolidated Fire Protection District). 2025. Stanislaus Consolidated Fire Protection District [Home Page], Accessed December 3, 2025. <https://www.scfpd.us>.

3.2.21 Mandatory Findings of Significance

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

Impact Analysis

- a) **Less than Significant with Mitigation Incorporated.** As described in the preceding impact discussions, the impacts related to the potential of the Project to substantially degrade the environment would be less than significant with incorporated mitigation measures. As described in this Initial Study, the Project has the potential for impacts related to biological resources, cultural resources, geology and soils (paleontological resources), and tribal cultural resources. However, these impacts would be avoided or reduced to a less-than-significant level with the incorporation of mitigation measures discussed in each section.
- b) **Less than Significant with Mitigation Incorporated.** This section provides a description of other actions in the area and a discussion of the cumulative impacts of those projects, in combination with the previously identified effects of the Project. CEQA Guidelines Section 15355 states that "cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts":
- The individual effects may be changes resulting from a single project or a number of separate projects.
 - The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

The Project is designed to enhance groundwater sustainability of the Turlock Subbasin, and is consistent with the GSP for the Turlock Subbasin, along with other groundwater recharge projects within ETSGSA. As discussed in the following cumulative analyses, there are no other closely

related past, present, or future projects in the vicinity of the Project that together with the Project would result in cumulatively considerable impacts.

Aesthetics. The Project would result in minimal aesthetic change in the Project area with the installation of the pipeline, pump station and associated infrastructure, and would be consistent with the rural agricultural nature of the existing setting. Therefore, the Project's contribution to cumulative aesthetic impacts would be less than significant.

Agriculture and Forestry Resources. Construction of the regulating basin on 7.5 acres would result in a negligible reduction of lands designated Prime Farmland, Unique Farmland and Farmland of Statewide Importance in Stanislaus County. The basin is considered a compatible agricultural use as it would facilitate conveyance of replenishment water to offset demand for groundwater pumping and provide in-lieu recharge benefits for sustainability of the Turlock Subbasin. Therefore, the Project would directly benefit agricultural users who rely on local groundwater resources. For these reasons, impacts related to conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance would be less than significant, and as such, cumulative impacts to agricultural resources would be less than significant. The Project would have no impact on forestry resources and thus would not contribute to cumulative impacts

Air Quality and Greenhouse Gas Emissions. A number of individual projects in the vicinity of the Project may be under construction simultaneously with the Project. Depending on construction schedules and actual implementation of projects in and around Sutter County, generation of fugitive dust and pollutant emissions during construction may result in short-term air pollutants, which would contribute to short-term cumulative impacts on air quality. However, each individual project would be subject to SJVAPCD rules, regulations, and other mitigation requirements during construction. For cumulative impacts on air quality and greenhouse gas emissions, see Section 3.2.3, *Air Quality*, and Section 3.2.8, *Greenhouse Gas Emissions*. The thresholds used consider the contributions of other projects in the air basin. Additionally, greenhouse gas emissions are considered cumulative in nature because it is unlikely that a single project would contribute significantly to climate change.

Biological Resources, Cultural Resources, Tribal Cultural Resources, Geology and Soils, and Hazards and Hazardous Materials. The Project's impacts for these environmental issues would be limited to the Project site, and any significant impacts would be reduced to a less-than-significant level by implementing proposed mitigation measures. Thus, the Project would not contribute to cumulative impacts for these topics.

Energy. Construction of the Project would result in fuel consumption from the use of construction tools and equipment, truck trips to haul materials, and vehicle trips by construction workers commuting to and from the Project site. This impact would be temporary and localized. Operational energy impacts are not anticipated. Construction-related fuel consumption by the Project would not result in inefficient, wasteful, or unnecessary energy use compared with other construction sites in the region. Thus, the Project would not contribute to cumulatively considerable impacts associated with energy consumption.

Hydrology and Water Quality. Implementation of the Project could result in erosion and sedimentation, and other construction site pollutants (e.g., fuels, solvents) entering stormwater runoff during construction. However, with implementation of the Project SWPPP and BMPs during construction as required by the NPDES Construction General Permit, impacts to surface water quality would be less than significant. The project would enhance groundwater recharge of the Turlock Subbasin, which would be a beneficial effect. Therefore, the Project would not result in cumulatively considerable impacts to water quality and hydrology.

Land Use and Land Use Planning. The Project would have no impact on land use and land use planning; therefore, it would not contribute to cumulative land use issues.

Mineral Resources. The Project would have no impact on mineral resources and thus would not contribute to cumulative impacts.

Noise. The Project's construction noise impacts are anticipated to be minor, and the Project would comply with the noise standards in the Noise Elements of the Stanislaus County and Merced County General Plans as well as the Stanislaus County and Merced County Code of Ordinances. Operation of the Project, including the pump station, would not result in a significant noise impact as operational noise would be within ambient rural noise levels. Thus, the Project's contribution to cumulative noise impacts would be less than significant.

Population and Housing. The Project would have no impact on population and housing resources and thus would not contribute to cumulative impacts.

Public Services. The Project's public services impacts are anticipated to be minor, and existing fire and police protection services in Stanislaus County and Merced County would be able to sufficiently respond to emergencies with existing equipment and staffing capacities. Thus, the Project would not contribute to a cumulatively considerable impact on public services.

Recreation. The Project would have no impact on recreation and thus would not contribute to cumulative impacts.

Transportation. The Project would not result in any significant transportation-related impacts and would not have the potential to contribute to cumulatively considered impacts associated with transportation.

Utilities and Service Systems. The Project does not include and would not require the relocation or construction of new or expanded wastewater treatment or area stormwater drainage, natural gas, or telecommunications facilities. The Project includes construction of infrastructure to deliver replenishment water for groundwater recharge on existing agricultural areas and requires construction of minor project-specific utility systems to operate the pump station including an additional TID electrical connection within Lake Road and a new below ground storm drain to capture on-site storm runoff. Impacts associated with the relocation or construction of utilities would be less than significant and would not be cumulatively considerable.

Wildfire. The Project is not located in a State Responsibility Area nor in an area classified by CAL Fire as high fire hazard severity zone. The Project would not contribute to cumulatively considerable impacts associated with wildfire.

- c) **Less than Significant with Mitigation Incorporated.** The Project would not result in any substantial adverse effects on human beings, either directly or indirectly, because each potentially significant impact can be reduced to a less-than-significant level with the implementation of the mitigation measures provided in this document. No other substantial adverse effects on human beings are anticipated as a result of the Project, resulting in a less-than-significant impact with mitigation incorporated.

References

N/A.

This page intentionally left blank

Appendix A

CalEEMod Detailed Report

EARI Turlock Pipeline v2 Detailed Report

Table of Contents

- 1. Basic Project Information
 - 1.1. Basic Project Information
 - 1.2. Land Use Types
 - 1.3. User-Selected Emission Reduction Measures by Emissions Sector
- 2. Emissions Summary
 - 2.1. Construction Emissions Compared Against Thresholds
 - 2.2. Construction Emissions by Year
 - 2.2.1. Total Construction Emissions by Year, Unmitigated
 - 2.2.2. Onsite Construction Emissions by Year, Unmitigated
 - 2.2.3. Offsite Construction Emissions by Year, Unmitigated
- 3. Construction Emissions Details
 - 3.1. Pipeline Construction & Conveyance Channel (2028)
 - 3.1.1. Onsite - Unmitigated
 - 3.1.2. Offsite - Unmitigated
 - 3.2. Site Preparation (2028)
 - 3.2.1. Onsite - Unmitigated
 - 3.2.2. Offsite - Unmitigated
 - 3.3. Grading (2028)

3.3.1. Onsite - Unmitigated

3.3.2. Offsite - Unmitigated

3.4. Building Construction (2028)

3.4.1. Onsite - Unmitigated

3.4.2. Offsite - Unmitigated

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

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

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

5. Activity Data

5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.1. Unmitigated

5.3. Construction Vehicles

5.3.1. Unmitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

5.18.2. Sequestration

5.18.2.1. Unmitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

8.1. Justifications

8.4. Construction

8.4.1. Construction Phases

8.4.4. Dust from Material Movement

8.4.6. Trips and VMT

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	EARI Turlock Pipeline v2
Construction Start Date	1/1/2028
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.10000
Precipitation (days)	29.0000
Location	37.56498236923585, -120.75796712719611
County	Stanislaus
City	Unincorporated
Air District	San Joaquin Valley APCD
Air Basin	San Joaquin Valley
TAZ	2225
EDFZ	14
Electric Utility	Turlock Irrigation District
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.46

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
General Light Industry	0.12000	1000sqft	0.00275	120.000	0.00000	0.00000	—	Pump Station
Road Construction	6.60000	Mile	20.0000	0.00000	0.00000	—	—	Conveyance pipeline

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.	3.32013	2.82661	20.7668	29.9383	0.06031	0.78399	0.86072	1.64470	0.72207	0.19364	0.91571	—	7,260.94	7,260.94	0.27019	0.15358	3.00934	7,316.47
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.90360	3.30038	27.6688	30.9325	0.06093	1.14375	0.86072	1.75364	1.05225	0.19364	1.19521	—	7,195.44	7,195.44	0.28529	0.15534	0.07810	7,248.70
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Unmit.	2.26772	1.91465	14.3817	20.2070	0.04097	0.54267	0.58382	1.12649	0.49977	0.13157	0.63133	—	4,912.52	4,912.52	0.18553	0.10159	0.88945	4,948.32
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.41386	0.34942	2.62467	3.68778	0.00748	0.09904	0.10655	0.20558	0.09121	0.02401	0.11522	—	813.324	813.324	0.03072	0.01682	0.14726	819.251

2.2. Construction Emissions by Year

2.2.1. Total Construction Emissions by Year, Unmitigated

Includes both onsite and offsite emissions.

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	3.32013	2.82661	20.7668	29.9383	0.06031	0.78399	0.86072	1.64470	0.72207	0.19364	0.91571	—	7,260.94	7,260.94	0.27019	0.15358	3.00934	7,316.47
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	3.90360	3.30038	27.6688	30.9325	0.06093	1.14375	0.86072	1.75364	1.05225	0.19364	1.19521	—	7,195.44	7,195.44	0.28529	0.15534	0.07810	7,248.70
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	2.26772	1.91465	14.3817	20.2070	0.04097	0.54267	0.58382	1.12649	0.49977	0.13157	0.63133	—	4,912.52	4,912.52	0.18553	0.10159	0.88945	4,948.32
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	0.41386	0.34942	2.62467	3.68778	0.00748	0.09904	0.10655	0.20558	0.09121	0.02401	0.11522	—	813.324	813.324	0.03072	0.01682	0.14726	819.251

2.2.2. Onsite 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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	2.97965	2.50373	20.0004	26.4210	0.05676	0.77398	0.10902	0.88300	0.71206	0.01184	0.72390	—	6,145.72	6,145.72	0.24930	0.04986	0.00000	6,166.81
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	3.61333	3.03620	27.4549	28.3524	0.06093	1.14375	0.10902	1.14375	1.05225	0.01184	1.05225	—	6,598.26	6,598.26	0.26765	0.05353	0.00000	6,620.90
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	2.04610	1.71930	13.8494	18.2040	0.03872	0.53634	0.06900	0.60534	0.49343	0.00749	0.50093	—	4,192.70	4,192.70	0.17007	0.03401	0.00000	4,207.08
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	0.37341	0.31377	2.52751	3.32223	0.00707	0.09788	0.01259	0.11047	0.09005	0.00137	0.09142	—	694.149	694.149	0.02816	0.00563	0.00000	696.531

2.2.3. Offsite 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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	0.34048	0.32288	0.76645	3.51726	0.00355	0.01001	0.75170	0.76170	0.01001	0.18180	0.19180	—	1,115.22	1,115.22	0.02089	0.10372	3.00934	1,149.66
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
2028	0.31125	0.27318	0.85601	2.73513	0.00355	0.01001	0.75170	0.76170	0.01001	0.18180	0.19180	—	1,049.72	1,049.72	0.02618	0.10548	0.07810	1,081.89
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	0.22162	0.19535	0.53236	2.00302	0.00225	0.00633	0.51482	0.52115	0.00633	0.12407	0.13040	—	719.825	719.825	0.01546	0.06758	0.88945	741.239
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	0.04045	0.03565	0.09716	0.36555	0.00041	0.00116	0.09396	0.09511	0.00116	0.02264	0.02380	—	119.175	119.175	0.00256	0.01119	0.14726	122.721

3. Construction Emissions Details

3.1. Pipeline Construction & Conveyance Channel (2028)

3.1.1. Onsite - 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
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.97965	2.50373	20.0004	26.4210	0.05676	0.77398	—	0.77398	0.71206	—	0.71206	—	6,145.72	6,145.72	0.24930	0.04986	—	6,166.81
Dust From Material Movement	—	—	—	—	—	—	0.10902	0.10902	—	0.01184	0.01184	—	—	—	—	—	—	—

EARI Turlock Pipeline v2 Detailed Report, 10/1/2026

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.97965	2.50373	20.0004	26.4210	0.05676	0.77398	—	0.77398	0.71206	—	0.71206	—	6,145.72	6,145.72	0.24930	0.04986	—	6,166.81
Dust From Material Movement	—	—	—	—	—	—	0.10902	0.10902	—	0.01184	0.01184	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.88575	1.58456	12.6578	16.7213	0.03592	0.48984	—	0.48984	0.45065	—	0.45065	—	3,889.48	3,889.48	0.15777	0.03155	—	3,902.83
Dust From Material Movement	—	—	—	—	—	—	0.06900	0.06900	—	0.00749	0.00749	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.34415	0.28918	2.31005	3.05163	0.00656	0.08940	—	0.08940	0.08224	—	0.08224	—	643.948	643.948	0.02612	0.00522	—	646.158

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Dust From Material Movement	—	—	—	—	—	—	0.01259	0.01259	—	0.00137	0.00137	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.1.2. Offsite - 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
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.31849	0.31320	0.16533	3.36537	0.00000	0.00000	0.60988	0.60988	0.00000	0.14296	0.14296	—	615.427	615.427	0.01235	0.02432	1.95936	624.943
Vendor	0.00116	0.00080	0.02721	0.00979	0.00016	0.00032	0.00601	0.00633	0.00032	0.00166	0.00198	—	21.2170	21.2170	0.00047	0.00318	0.04317	22.2195
Hauling	0.02083	0.00888	0.57391	0.14210	0.00339	0.00969	0.13580	0.14549	0.00969	0.03718	0.04687	—	478.578	478.578	0.00807	0.07622	1.00680	502.500
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.29027	0.26418	0.21397	2.58010	0.00000	0.00000	0.60988	0.60988	0.00000	0.14296	0.14296	—	549.596	549.596	0.01764	0.02609	0.05089	557.861
Vendor	0.00111	0.00076	0.02889	0.01019	0.00016	0.00032	0.00601	0.00633	0.00032	0.00166	0.00198	—	21.2411	21.2411	0.00047	0.00318	0.00112	22.2016
Hauling	0.01986	0.00824	0.61315	0.14485	0.00339	0.00969	0.13580	0.14549	0.00969	0.03718	0.04687	—	478.887	478.887	0.00807	0.07622	0.02609	501.829
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.18482	0.16831	0.12003	1.69346	0.00000	0.00000	0.37879	0.37879	0.00000	0.08868	0.08868	—	358.415	358.415	0.00893	0.01539	0.53563	363.761
Vendor	0.00072	0.00049	0.01789	0.00631	0.00010	0.00020	0.00375	0.00395	0.00020	0.00104	0.00124	—	13.4341	13.4341	0.00030	0.00201	0.01182	14.0531

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Hauling	0.01288	0.00542	0.37936	0.09065	0.00215	0.00613	0.08472	0.09086	0.00613	0.02323	0.02936	—	302.963	302.963	0.00511	0.04824	0.27475	317.740
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03373	0.03072	0.02190	0.30906	0.00000	0.00000	0.06913	0.06913	0.00000	0.01618	0.01618	—	59.3397	59.3397	0.00148	0.00255	0.08868	60.2248
Vendor	0.00013	0.00009	0.00326	0.00115	0.00002	0.00004	0.00068	0.00072	0.00004	0.00019	0.00023	—	2.22417	2.22417	0.00005	0.00033	0.00196	2.32664
Hauling	0.00235	0.00099	0.06923	0.01654	0.00039	0.00112	0.01546	0.01658	0.00112	0.00424	0.00536	—	50.1590	50.1590	0.00085	0.00799	0.04549	52.6055

3.2. Site Preparation (2028)

3.2.1. Onsite - 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
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.61333	3.03620	27.4549	28.3524	0.04893	1.14375	—	1.14375	1.05225	—	1.05225	—	5,300.02	5,300.02	0.21499	0.04300	—	5,318.21
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03960	0.03327	0.30088	0.31071	0.00054	0.01253	—	0.01253	0.01153	—	0.01153	—	58.0825	58.0825	0.00236	0.00047	—	58.2818

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.00723	0.00607	0.05491	0.05670	0.00010	0.00229	—	0.00229	0.00210	—	0.00210	—	9.61621	9.61621	0.00039	0.00008	—	9.64921
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.2.2. Offsite - 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
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.29027	0.26418	0.21397	2.58010	0.00000	0.00000	0.60988	0.60988	0.00000	0.14296	0.14296	—	549.596	549.596	0.01764	0.02609	0.05089	557.861
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00320	0.00291	0.00208	0.02932	0.00000	0.00000	0.00656	0.00656	0.00000	0.00154	0.00154	—	6.20632	6.20632	0.00015	0.00027	0.00927	6.29889
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00058	0.00053	0.00038	0.00535	0.00000	0.00000	0.00120	0.00120	0.00000	0.00028	0.00028	—	1.02753	1.02753	0.00003	0.00004	0.00154	1.04285
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.3. Grading (2028)

3.3.1. Onsite - 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
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.42509	2.87803	24.3289	27.1688	0.06093	0.98510	—	0.98510	0.90629	—	0.90629	—	6,598.26	6,598.26	0.26765	0.05353	—	6,620.90
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09384	0.07885	0.66655	0.74435	0.00167	0.02699	—	0.02699	0.02483	—	0.02483	—	180.774	180.774	0.00733	0.00147	—	181.395

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01713	0.01439	0.12164	0.13584	0.00030	0.00493	—	0.00493	0.00453	—	0.00453	—	29.9292	29.9292	0.00121	0.00024	—	30.0320
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.3.2. Offsite - 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
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.29027	0.26418	0.21397	2.58010	0.00000	0.00000	0.60988	0.60988	0.00000	0.14296	0.14296	—	549.596	549.596	0.01764	0.02609	0.05089	557.861
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00800	0.00729	0.00520	0.07331	0.00000	0.00000	0.01640	0.01640	0.00000	0.00384	0.00384	—	15.5158	15.5158	0.00039	0.00067	0.02319	15.7472
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00146	0.00133	0.00095	0.01338	0.00000	0.00000	0.00299	0.00299	0.00000	0.00070	0.00070	—	2.56882	2.56882	0.00006	0.00011	0.00384	2.60713
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.4. Building Construction (2028)

3.4.1. Onsite - 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
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.65497	0.55036	5.45459	10.4062	0.01447	0.16989	—	0.16989	0.15629	—	0.15629	—	1,566.04	1,566.04	0.06353	0.01271	—	1,571.41
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02692	0.02262	0.22416	0.42765	0.00059	0.00698	—	0.00698	0.00642	—	0.00642	—	64.3578	64.3578	0.00261	0.00052	—	64.5786

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.00491	0.00413	0.04091	0.07805	0.00011	0.00127	—	0.00127	0.00117	—	0.00117	—	10.6552	10.6552	0.00043	0.00009	—	10.6917
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.4.2. Offsite - 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
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.29027	0.26418	0.21397	2.58010	0.00000	0.00000	0.60988	0.60988	0.00000	0.14296	0.14296	—	549.596	549.596	0.01764	0.02609	0.05089	557.861
Vendor	0.00002	0.00001	0.00057	0.00020	< 0.00005	0.00001	0.00012	0.00012	0.00001	0.00003	0.00004	—	0.41777	0.41777	0.00001	0.00006	0.00002	0.43666
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01200	0.01093	0.00779	0.10996	0.00000	0.00000	0.02460	0.02460	0.00000	0.00576	0.00576	—	23.2737	23.2737	0.00058	0.00100	0.03478	23.6208
Vendor	< 0.00005	< 0.00005	0.00002	0.00001	< 0.00005	< 0.00005	< 0.00005	0.00001	< 0.00005	< 0.00005	< 0.00005	—	0.01716	0.01716	< 0.00005	< 0.00005	0.00002	0.01795

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00219	0.00199	0.00142	0.02007	0.00000	0.00000	0.00449	0.00449	0.00000	0.00105	0.00105	—	3.85323	3.85323	0.00010	0.00017	0.00576	3.91070
Vendor	< 0.0000 05	< 0.0000 05	< 0.0000 05	< 0.0000 05	< 0.0000 05	< 0.0000 05	< 0.0000 05	< 0.0000 05	< 0.0000 05	< 0.0000 05	< 0.0000 05	—	0.00284	0.00284	< 0.0000 05	< 0.0000 05	< 0.0000 05	0.00297
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

EARI Turlock Pipeline v2 Detailed Report, 10/1/2026

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

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
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
Pipeline Construction & Conveyance Channel	Linear, Grading & Excavation	2/11/2028	12/31/2028	5.00000	231.000	—
Site Preparation	Site Preparation	1/1/2028	1/6/2028	5.00000	4.00000	—
Grading	Grading	1/7/2028	1/20/2028	5.00000	10.00000	—
Building Construction	Building Construction	1/21/2028	2/10/2028	5.00000	15.0000	—

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
Pipeline Construction & Conveyance Channel	Excavators	Diesel	Average	3.00000	8.00000	36.0000	0.38000

EARI Turlock Pipeline v2 Detailed Report, 10/1/2026

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Pipeline Construction & Conveyance Channel	Graders	Diesel	Average	1.000000	8.00000	148.000	0.41000
Pipeline Construction & Conveyance Channel	Rollers	Diesel	Average	2.00000	8.00000	36.0000	0.38000
Pipeline Construction & Conveyance Channel	Rubber Tired Loaders	Diesel	Average	1.000000	8.00000	150.000	0.36000
Pipeline Construction & Conveyance Channel	Scrapers	Diesel	Average	2.00000	8.00000	423.000	0.48000
Pipeline Construction & Conveyance Channel	Tractors/Loaders/Backhoes	Diesel	Average	2.00000	8.00000	84.0000	0.37000
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00000	8.00000	84.0000	0.37000
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00000	8.00000	367.000	0.40000
Grading	Graders	Diesel	Average	1.000000	8.00000	148.000	0.41000
Grading	Rubber Tired Dozers	Diesel	Average	1.000000	8.00000	367.000	0.40000
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00000	8.00000	84.0000	0.37000
Grading	Excavators	Diesel	Average	2.00000	8.00000	36.0000	0.38000
Grading	Scrapers	Diesel	Average	2.00000	8.00000	423.000	0.48000
Building Construction	Forklifts	Diesel	Average	3.00000	8.00000	82.0000	0.20000
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00000	7.00000	84.0000	0.37000

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Building Construction	Other Material Handling Equipment	Diesel	Average	1.000000	8.00000	93.0000	0.40000

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Pipeline Construction & Conveyance Channel	Worker	80.0000	10.7900	LDA,LDT1,LDT2
Pipeline Construction & Conveyance Channel	Vendor	1.000000	7.17000	HHDT,MHDT
Pipeline Construction & Conveyance Channel	Hauling	7.32468	20.0000	HHDT
Pipeline Construction & Conveyance Channel	Onsite truck	—	—	HHDT
Site Preparation	Worker	80.0000	10.7900	LDA,LDT1,LDT2
Site Preparation	Vendor	—	7.17000	HHDT,MHDT
Site Preparation	Hauling	0.00000	20.0000	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	Worker	80.0000	10.7900	LDA,LDT1,LDT2
Grading	Vendor	—	7.17000	HHDT,MHDT
Grading	Hauling	0.00000	20.0000	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	Worker	80.0000	10.7900	LDA,LDT1,LDT2

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Building Construction	Vendor	0.01967	7.17000	HHDT,MHDT
Building Construction	Hauling	0.00000	20.0000	HHDT
Building Construction	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%

5.5. Architectural Coatings

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 (sq. ft.)	Acres Paved (acres)
Pipeline Construction & Conveyance Channel	0.00000	13,528.3	30.0000	0.00000	0.00000

5.6.2. Construction Earthmoving Control Strategies

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

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2028	0.00000	609.277	0.23733	0.33904

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	24.4900	annual days of extreme heat
Extreme Precipitation	2.70000	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	0.00000	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	4	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	0	0	0	N/A
Drought	0	0	0	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	4	1	1	4
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	1	1	1	2
Drought	1	1	1	2

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
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	74.1008
AQ-PM	56.8637
AQ-DPM	14.8227
Drinking Water	97.3024
Lead Risk Housing	54.6692
Pesticides	95.0000

Indicator	Result for Project Census Tract
Toxic Releases	27.7444
Traffic	2.43750
Effect Indicators	—
CleanUp Sites	20.4741
Groundwater	92.6283
Haz Waste Facilities/Generators	16.6380
Impaired Water Bodies	66.7367
Solid Waste	63.6655
Sensitive Population	—
Asthma	25.2991
Cardio-vascular	57.9636
Low Birth Weights	40.9418
Socioeconomic Factor Indicators	—
Education	60.3138
Housing	17.9341
Linguistic	33.3063
Poverty	51.0930
Unemployment	81.0125

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	46.59309637
Employed	29.51366611
Median HI	45.88733479
Education	—
Bachelor's or higher	31.19466188
High school enrollment	10.27845502
Preschool enrollment	44.15501091
Transportation	—
Auto Access	58.09059412
Active commuting	67.03451816
Social	—
2-parent households	49.03118183
Voting	63.27473374
Neighborhood	—
Alcohol availability	84.10111639
Park access	6.185037854
Retail density	1.219042731
Supermarket access	16.51482099
Tree canopy	75.47799307
Housing	—

Indicator	Result for Project Census Tract
Homeownership	67.43231105
Housing habitability	78.91697677
Low-inc homeowner severe housing cost burden	86.82150648
Low-inc renter severe housing cost burden	60.50301553
Uncrowded housing	58.11625818
Health Outcomes	—
Insured adults	62.50481201
Arthritis	0.0
Asthma ER Admissions	74.2
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	49.5
Cognitively Disabled	10.2
Physically Disabled	22.7
Heart Attack ER Admissions	48.6
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0

Indicator	Result for Project Census Tract
Obesity	0.0
Pedestrian Injuries	19.6
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	44.4
Elderly	33.9
English Speaking	43.7
Foreign-born	16.0
Outdoor Workers	12.0
Climate Change Adaptive Capacity	—
Impervious Surface Cover	97.6
Traffic Density	1.9
Traffic Access	0.0
Other Indices	—

Indicator	Result for Project Census Tract
Hardship	57.6
Other Decision Support	—
2016 Voting	74.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	59.0000
Healthy Places Index Score for Project Location (b)	41.0000
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

8.1. Justifications

Screen	Justification
Construction: Construction Phases	Project Specific Information: year-long construction schedule
Construction: Off-Road Equipment	Equipment types provided by Project applicant.
Construction: Dust From Material Movement	Material quantities supplied by project applicant.
Construction: Trips and VMT	Project Specific Information: Worker Trips Adjusted for Max Number of On-site workers, 40 workers, 2 one-way trips each.
Operations: Energy Use	No Natural Gas
Operations: Water and Waste Water	Project Specific Information, no associated use for pump station
Operations: Solid Waste	Project Specific Information, no associated use for pump station
Operations: Refrigerants	Project Specific Information, no associated use for pump station

8.4. Construction

8.4.1. Construction Phases

Phase Type	Phase Name	Model Parameter	Default Value	New Value
Site Preparation	Site Preparation	Start Date	1/16/2028	1/1/2028
Site Preparation	Site Preparation	End Date	1/17/2028	1/6/2028
Site Preparation	Site Preparation	Work Days per Phase	1.000000	4.00000
Grading	Grading	Start Date	1/18/2028	1/7/2028
Grading	Grading	Work Days per Phase	2.00000	10.00000

Phase Type	Phase Name	Model Parameter	Default Value	New Value
Building Construction	Building Construction	End Date	6/9/2028	2/10/2028
Building Construction	Building Construction	Work Days per Phase	100.0000	15.0000

8.4.4. Dust from Material Movement

Phase Name	Model Parameter	Units	Default Value	New Value
Pipeline Construction & Conveyance Channel	Material Imported	Cubic Yards	—	0.00000
Pipeline Construction & Conveyance Channel	Material Exported	Cubic Yards	—	13,528.3
Pipeline Construction & Conveyance Channel	Total Acres Graded	acres	20.0000	30.0000

8.4.6. Trips and VMT

Phase Name	Trip Type	Model Parameter	Default Value	New Value
Pipeline Construction & Conveyance Channel	Worker	One-Way Trips per Day	27.5000	80.0000
Site Preparation	Worker	One-Way Trips per Day	17.5000	80.0000
Grading	Worker	One-Way Trips per Day	20.0000	80.0000
Building Construction	Worker	One-Way Trips per Day	0.05040	80.0000

Appendix B

Biological Constraints Report

Final

EASTSIDE AQUIFER RESTORATION INITIATIVE

Biological Constraints Report

Prepared for
Davids Engineering, Inc

July 2026



Final

EASTSIDE AQUIFER RESTORATION INITIATIVE

Biological Constraints Report

Prepared for
Davids Engineering, Inc

July 2026

2600 Capitol Avenue
Suite 200
Sacramento, CA 95816
916.564.4500
esassoc.com

Bend	Pasadena	San Francisco
Irvine	Pensacola	San Jose
Los Angeles	Petaluma	Santa Barbara
Mobile	Portland	Sarasota
Oakland	Rancho Cucamonga	Seattle
Orlando	Sacramento	Tampa
Palm Beach County	San Diego	Thousand Oaks



CONTENTS

Eastside Aquifer Restoration Initiative

Chapter 1. Introduction	1
1.1 Background and Purpose for the Biological Constraints Review	1
1.2 Study Area Description	1
Chapter 2. Methods.....	5
2.1 Review of Background Information	5
2.2 Survey Dates and Surveying Personnel	5
2.3 Regulatory Context.....	5
Chapter 3. Environmental Setting	7
3.1 Soils.....	7
3.2 Hydrology	8
3.3 Biological Communities and Wildlife Habitats.....	8
3.4 Special-Status Species	15
3.5 Wildlife Movement Corridors	18
3.6 Critical Habitat for Listed Fish and Wildlife Species	18
3.7 Heritage and Protected Trees.....	18
Chapter 4. Recommendations	19
4.1 California Tiger Salamander	19
4.2 Western Spadefoot.....	20
4.3 Special-Status and Other Nesting Birds	20
4.4 Special-Status Plants	21
4.5 Wetlands and Waters of the U.S. and State, and Lake and Streambed Alteration.....	21
Chapter 5. References	23

Tables

Table 1	Map Geological Unit Names	7
---------	---------------------------------	---

Figures

Figure 1	Regional Location	2
Figure 2	Project Vicinity.....	3
Figure 3	CNDDDB Occurrences.....	16

Appendices

Appendix A	National Wetland Inventory
Appendix B	Special-Status Species with Potential to Occur in the Study Area

Acronyms and Other Abbreviations

Abbreviation	Definition
ESA	Environmental Science Associates
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CVRWQCB	Central Valley Regional Water Quality Control Board
CVFPB	Central Valley Flood Protection Board
CWA	Clean Water Act
FESA	Federal Endangered Species Act
LSA	Lake or Streambed Alteration Program
MBTA	Migratory Bird Treaty Act
NAVD	North American Vertical Datum
NRCS	Natural Resources Conservation Service
RD	Reclamation District
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

CHAPTER 1

Introduction

1.1 Background and Purpose for the Biological Constraints Review

This report presents an evaluation of the special-status wildlife, plants, and other sensitive biological resources that potentially occur within the Eastside Aquifer Restoration Initiative Project (Project) Study Area (Study Area). The evaluation is based on background data review of biological resources in the Study Area and vicinity as well as reconnaissance surveys conducted by Environmental Science Associates (ESA) in December 2025 and May 2026. The intent and scope of this document are to characterize these biological resources in the Study Area (Figure 1) and propose measures to protect sensitive biological resources during installation of the project components.

1.2 Study Area Description

The Project site is in the eastern portion of Stanislaus and Merced Counties, east of Montpelier Road (County Highway J9), south of the Turlock Irrigation District (TID) Main Canal and north of the Merced River (Figure 2). The center of the Study Area is approximately 9 miles southeast of the City of Turlock. The Study Area is a mostly linear footprint measuring approximately 7.69 miles North to South. Specifically, the proposed project is within Sections 3, 10, 15, 22, 26, 27, and 35 of Township 4 South, Range 12 East (Mount Diablo Base and Meridian) and Sections 3 and 10 of Township 5 South, Range 12 East, per the Public Land Survey System. It is bounded on the west by the paved two-lane Hawkins Road and on the east by Bledsoe Road.

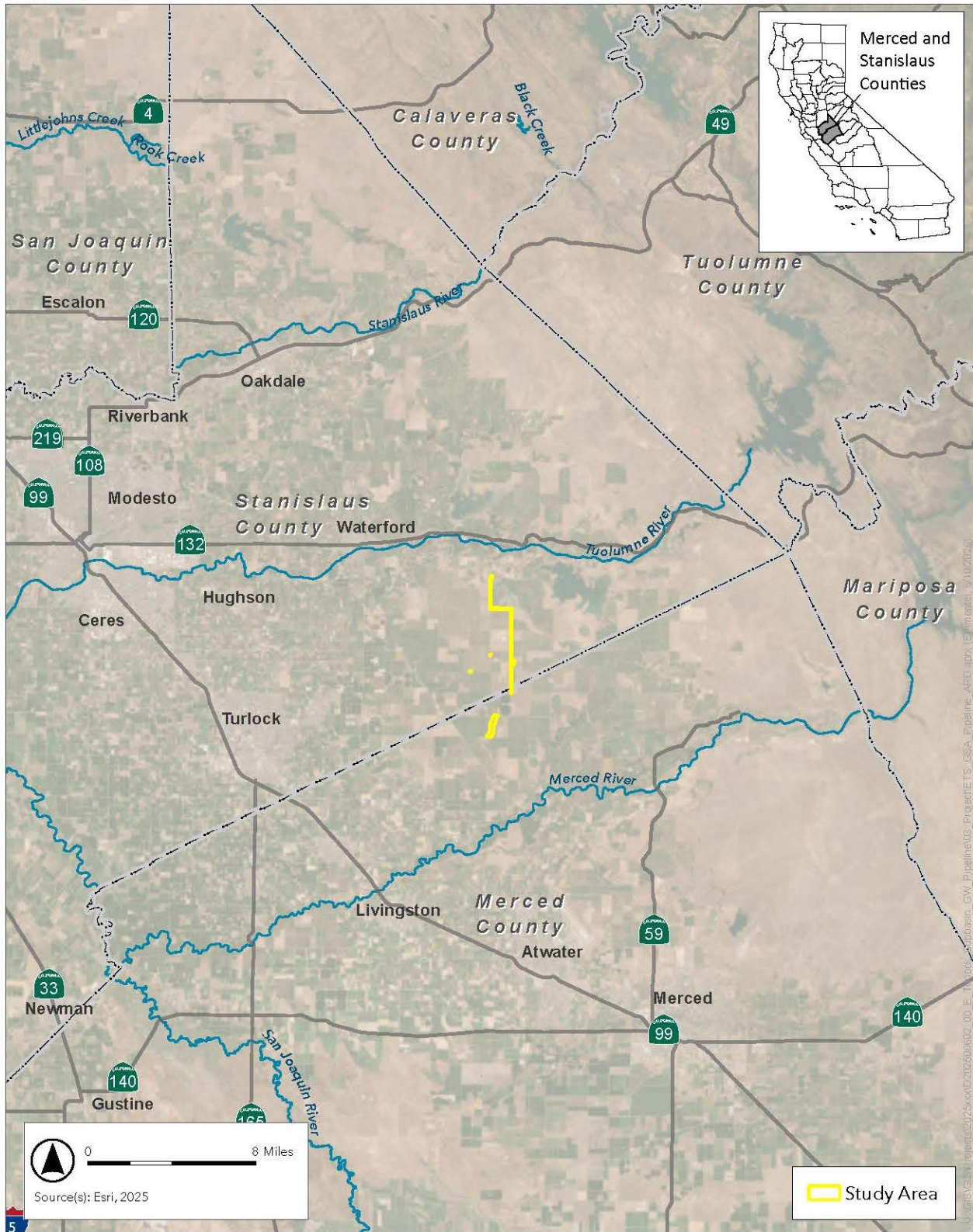


Figure 1
Regional Location



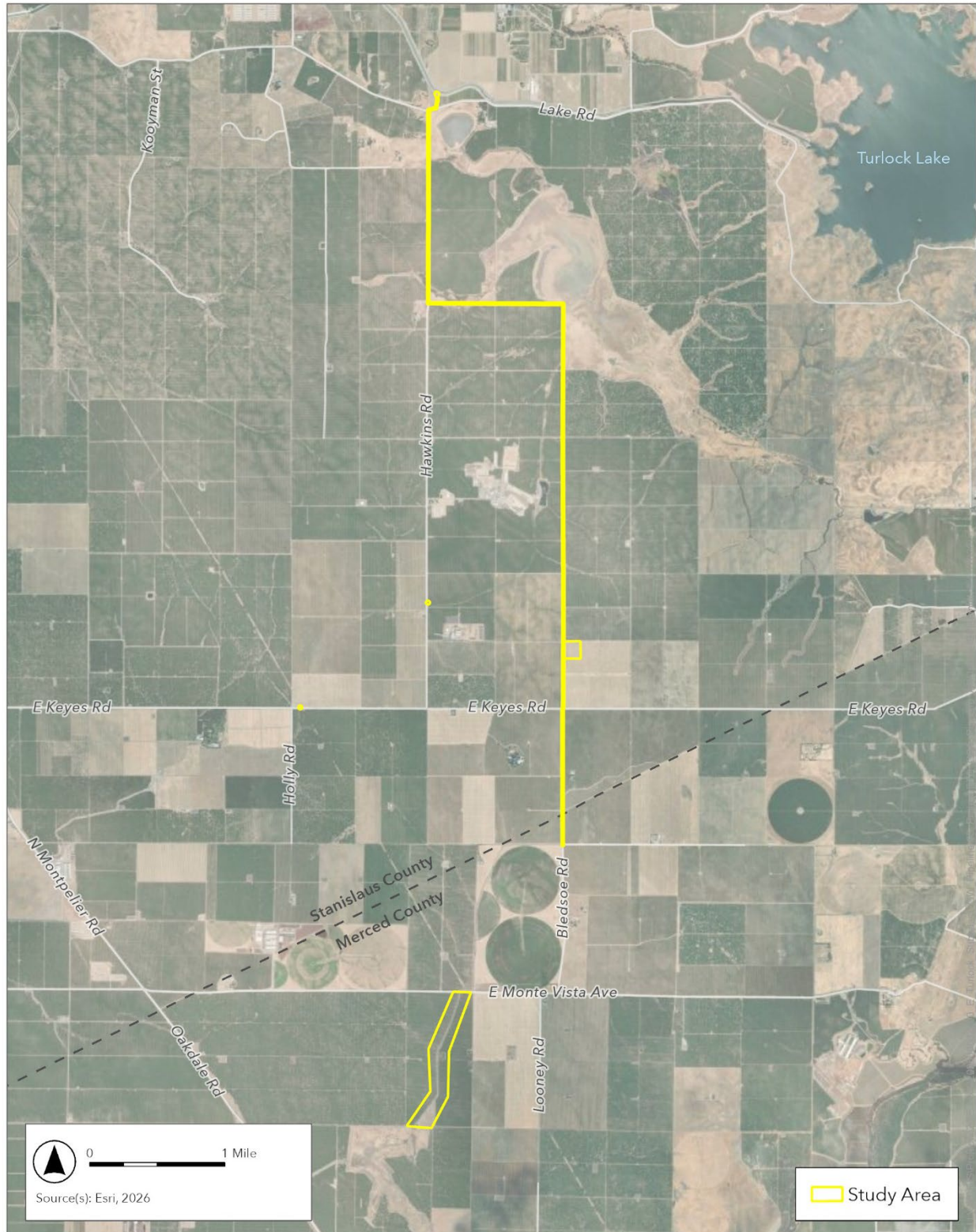


Figure 2
Project Vicinity



This page intentionally left blank

CHAPTER 2

Methods

2.1 Review of Background Information

Prior to performing reconnaissance biological surveys, ESA reviewed publicly available data, subscription-based biological resource data, and Study Area-specific information. Data sources that assisted in this analysis include:

- Topographic maps
- Historic and current aerial imagery (Google Earth 2025)
- The California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CDFW 2026)
- The United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (**Appendix A**) (USFWS 2025b)
- The California Native Plant Society (CNPS) online database (CNPS 2025)
- Soil maps from the Natural Resources Conservation Service (NRCS 2025)

2.2 Survey Dates and Surveying Personnel

Biological reconnaissance surveys of the Study Area (disturbance footprint plus a 100-foot buffer) were conducted by ESA Angelica Oregel and Missy Zepeda on December 1 and 2, 2025. An additional biological reconnaissance survey was conducted on May 4, 2026, by ESA biologists AJ Samra and Ariana Catanuso following the addition of new locations as part of a modified project design. Surveys were conducted to observe and characterize vegetation communities in the Study Area and to assess habitat quality and potential for common and special-status wildlife species to occur within the Study Area or the vicinity.

2.3 Regulatory Context

Biological resources in the Study Area may fall under the jurisdiction of various regulatory agencies and be subject to their regulations. In general, the greatest legal protections are provided for plant and wildlife species that are formally listed by the federal or state government. The following regulations and agencies are commonly associated with projects that have the potential to affect biological resources:

- Federal Endangered Species Act (FESA)
- Migratory Bird Treaty Act (MBTA)

- Federal Bald and Golden Eagle Protection Act
- Federal Clean Water Act (CWA), Section 404
- California Endangered Species Act (CESA)
- California Fish and Game Code Section 3500-3705, Migratory Bird Protection
- California Native Plant Protection Act
- California Fish and Game Code Section 1600, Lake or Streambed Alteration Program (LSA)
- California Porter Cologne Water Quality Act
- California Environmental Quality Act (CEQA) Guidelines Section 15380

These regulations are presented and discussed in Chapter 4, recommendations.

CHAPTER 3

Environmental Setting

This section provides the environmental baseline for soils, vegetation communities and habitats, and special-status plant and wildlife species in the Study Area.

3.1 Soils

The NRCS is a branch of the U.S. Department of Agriculture whose National Cooperative Soil Survey program produces soil data and provides information to the general public. NRCS has soil maps and data for approximately 95 percent of the nation's counties, including Merced and Stanislaus County. Their reference materials include soil surveys, maps, reports and inventories, scientific and research reports and data, forestry, range, and wildlife inventories and studies, and official soil series and soil interpretations.

According to the NRCS soils report, 26 soil units occur within the Study Area, as shown in **Table 1**.

TABLE 1
MAP GEOLOGICAL UNIT NAMES

Map Unit Symbol	Map Unit Name	Acres in Study Area	Percent of Study Area
AfB	Atwater loamy sand, 3 to 8 percent slopes	3.8	3.2%
AgB	Atwater loamy sand, deep over hardpan, 3 to 8 percent slopes	2.7	2.3%
GsA	Greenfield sandy loam, 0 to 3 percent slopes	3.6	3.0%
GvA	Greenfield sandy loam, moderately deep and deep over hardpan, 0 to 3 percent slopes	9.1	7.7%
HdA	Hanford sandy loam, 0 to 3 percent slopes	2.1	1.8%
MkA	Meikle clay, 0 to 1 percent slopes	1.8	1.5%
MtB	Montpellier coarse sandy loam, 3 to 8 percent slopes	7.3	6.2%
MtC2	Montpellier coarse sandy loam, 8 to 15 percent slopes, eroded	1.8	1.6%
PmC2	Pentz loam, moderately deep, 8 to 15 percent slopes	8.6	7.3%
RkA	Rocklin sandy loam, 0 to 3 percent slopes	1.2	1.0%
RkB	Rocklin sandy loam, 3 to 8 percent slopes, eroded	6.2	5.3%
RkC2	Rocklin sandy loam, 8 to 15 percent slopes, eroded	0.7	0.6%
SaB	San Joaquin sandy loams, 3 to 8 percent slopes	4.9	4.2%
ScA	San Joaquin sandy loam, 0 to 3 percent slopes	2.0	1.7%
ScB	San Joaquin sandy loam, 3 to 8 percent slopes	4.6	3.9%
SnA	Snelling sandy loam, 0 to 3 percent slopes	2.1	1.8%
SnB	Snelling sandy loam, 3 to 8 percent slopes	3.1	2.7%
TuA	Tujunga loamy sand, 0 to 3 percent slopes	1.7	1.4%

Map Unit Symbol	Map Unit Name	Acres in Study Area	Percent of Study Area
TvA	Tujunga sand, 0 to 3 percent slopes	0.4	0.4%
W	Water	0.4	0.4%
WhB	Whitney fine sandy loam, 3 to 8 percent slopes	0.7	0.6%
WmB2	Whitney and Rocklin soils, 3 to 8 percent slopes, eroded	16.2	13.8%
WmC2	Whitney sandy loams, 8 to 15 percent slopes, eroded	11.3	9.6%
WmD2	Whitney sandy loams, 15 to 30 percent slopes, eroded	15.0	12.7%
WmE2	Whitney sandy loams, 30 to 45 percent slopes, eroded	0.0	0.0%
WrB	Whitney and Rocklin sandy loams, 3 to 8 percent slopes	4.0	3.4%
WrC	Whitney and Rocklin sandy loams, 8 to 15 percent slopes	2.2	1.9%
Total for Study Area		117.6	100.0%
SOURCE: USGS 2025			

The surface geology of the Study Area consists predominantly of sand and sandy loams. The majority of the soils within the Study Area are formed in alluvium derived from granite. The sandy loams that make up the majority of the Study Area are primarily well drained with runoff ranging from very high to very low.

3.2 Hydrology

ESA prepared an Aquatic Resources Delineation Report for the Project (July 2026), and all relevant aspects of the Study Area hydrology are discussed in that report.

3.3 Biological Communities and Wildlife Habitats

Biological communities within the Study Area could provide potential habitat for special-status species, and are described below.

Upland biological communities within the Study Area include a variety of agriculture crops, grassland, and disturbed. Plant communities and habitats associated with aquatic settings within the Study Area include freshwater emergent wetland, ephemeral streams, vernal pools, and a pond. A formal delineation of aquatic resources was conducted by ESA at the same time as the biological reconnaissance survey and the boundary delineation results are presented in a separate Aquatic Resources Delineation Report. Sensitive natural communities, such as those with a State rarity ranking of S1, S2, or S3, are identified within the descriptions below.

Sand Creek was a historic intermittent drainage but was artificially altered, and the portion within the Study Area does not convey irrigation flows nor exhibit any features that characterize it as a state or federal jurisdictional water or wetland. Habitat is a combination of ruderal species and agriculture.

3.3.1 Agriculture

The Study Area is comprised mainly of agricultural land. In general, agricultural land within the Study Area has been leveled and undergoes frequent, generally seasonal cycles of crop growth and harvesting, along with applications of irrigation water, fertilizers, and pesticides. Study Area agriculture types fall into five main categories described below.

In general, croplands support relatively low species diversity, but the value of agricultural lands for special-status and common wildlife species varies greatly among crop types and agricultural practices. Agricultural lands close to natural land cover can provide functions that complement and increase the habitat value of the natural land cover. For example, some raptors nest in valley foothill riparian habitat but forage in nearby croplands.

Orchard

Irrigated crops in the orchards around the Study Area include almonds, grape vineyards and pistachios (**Photo 1**). In general, the agricultural fields in the Study Area are kept extremely clean with very few weeds at the field margins, healthy crops, well-maintained roads, and properly functioning drainage and irrigation systems.

Fallow

Several fallow fields border the sides of the Study Area (**Photo 2**). Agricultural practices use fallow fields to encourage soil recovery in between growing cycles. Fallow fields are temporary and become irrigated agricultural regularly.

Disturbed/Ruderal

Disturbed/ruderal areas include dirt, gravel, and paved roads throughout the Study Area along with roadsides and levee slopes (**Photo 3**). These areas are either unvegetated with heavily compacted substrate or are sparsely to densely vegetated with weeds.



Photo 1. Orchard habitat north of E Keyes Rd. Photo facing north.



Photo 2. Fallow field along Looney Rd south of E. Monte Vista Ave. Photo facing south.



Photo 3. Ruderal north of Lake Rd. Photo facing north.

3.3.2 Aquatic Habitats

This habitat type is comprised of year-round bodies of fresh water in the form of lakes, streams, ponds or rivers. This includes those portions of water bodies that are usually covered by water and contain less than 10 percent vegetative cover.

Freshwater Emergent Wetland

These emergent wetlands identified in the Study Area occur along the drainages that pond water or remain saturated for extended periods during a portion of the year, often throughout the wet season, then dry up in spring or early summer (**Photo 4**).

Dominant plant species include narrow leaf cattail (*Typha angustifolia*, OBL¹), taper tip flatsedge (*Cyperus acuminatus*, OBL), coyote willow (*Salix exigua*, FACW) and poison hemlock (*Conium maculatum*, FACW).

Mustang Creek

Intermittent streams, also referred to as seasonal streams, are present during certain times of the year. The identified intermittent stream in the Study Area is Mustang Creek which intersects an ephemeral drainage adjacent to Bledsoe Road and an entire segment of the feature is present at the southern edge of

¹ FAC = facultative (occurs in wetlands and non-wetlands); FACW = facultative wetland (usually occurs in wetlands but may occur in non-wetlands); OBL = obligate wetland (almost always occurs in wetlands under natural conditions); NL = not listed.



Photo 4. Freshwater emergent wetland. Photo facing northwest.

the Study Area (**Photo 5**). During the time of the survey, an OHWM was observed along the entirety of the feature.

Ephemeral streams

Ephemeral streams are present temporarily. The identified ephemeral ditches in the Study Area are small and shallow ditches in the agriculture fields within the Study Area. The ditches were characterized as exhibiting ephemeral hydrology based on field observations and analysis of historical aerial imagery, indicating that surface flow is primarily driven by agricultural runoff and storm events (**Photo 6**).

Northern Hardpan Vernal Pools

Northern Hardpan vernal pools are a sensitive natural community with a state rank of S3.1 indicating they are vulnerable and have a moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors. This community is restricted to the northeastern portion of the project along Hickman Road, adjacent to Rainbow farms (**Photo 7**).

Pond

The pond feature is an isolated, small pond approximately 35 feet in diameter and 6 feet deep just south of TID Main Canal. It appears to be associated with agricultural pumping operations. Surface water was present at the time of the survey (**Photo 8**).



Photo 5. Mustang Creek, facing south.



Photo 6. View of the ephemeral drainage that intersects Mustang Creek. View facing west.



Photo 7. View of Northern Hardpan vernal pools. Photo facing east.



Photo 8. View of a man-made pond. Photo facing northeast.

3.4 Special-Status Species

Several species known to occur on or in the vicinity of the Study Area are protected pursuant to federal and/or State endangered species laws or have been designated as Species of Special Concern by CDFW. In addition, Section 15380(b) of the *CEQA Guidelines* provides a definition of rare, endangered, threatened species that are not included in any listing.² Species recognized under these terms are collectively referred to as “special-status species.”

A list of special-status species with potential to occur on or in the vicinity of the Study Area was compiled from a nine-quad search of the California Natural Diversity Database (CNDDDB) (CDFW, 2025a), a nine-quad search on the California Native Plant Society’s Rare Plant Inventory (CNPS, 2025), a Study Area search of the USFWS endangered species database (USFWS, 2025b), and biological literature on the region for the surrounding 7.5-minute USGS topographic quadrangles. The quadrangles for the Study Area were Montpelier, Turlock Lake, Winton, Cressey, Turlock, Denair, Waterford, Paulsell, Cooperstown. **Figure 3** is a map of CNDDDB special-status species occurrences within 5 miles of the Study Area.

From the full list of species, each was then individually assessed based on habitat requirements and distribution relative to vegetation communities and habitat features that occur in and around the Study Area. A comprehensive list of special-status species that were considered in the analysis is provided in **Appendix B, Special-Status Species with Potential to Occur within the Study Area.**

3.4.1 Special-Status Plants

No special-status plants were identified during the December 1 and 2, 2025, and May 4, 2026, biological reconnaissance surveys of the Study Area.

Based on the habitat types and conditions within the Study Area, along with review of background information and database searches a variety of special-status plant species have potential to occur in the Study Area and are listed in Appendix B. From this list, 14 special-status plant species were determined to have low to no potential to occur within the Study Area and no potential to be affected by the project: beaked clarkia (*Clarkia rostrata*), Delta button-celery (*Eryngium racemosum*), dwarf Downingia (*Downingia pusilla*), forked hare-leaf (*Lagophylla dichotoma*), Hartweg's golden sunburst (*Pseudobahia bahiifolia*), heartscale (*Atriplex cordulata* var. *cordulata*), Hoover's calycadenia (*Calycadenia hooveri*), Hoover's cryptantha (*Cryptantha hooveri*), Merced monardella (*Monardella leucocephala*), subtle orache (*Atriplex subtilis*), succulent owl's-clover (*Castilleja campestris* var. *succulenta*), Greene's tuctoria (*Tuctoria greenei*), hairy Orcutt grass (*Orcuttia pilosa*), and San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*). From this list, 2 special-status plant species were determined to have moderate potential to occur within the Study Area and potential to be affected by the project: Hoover's spurge (*Euphorbia hooveri*), and Colusa grass (*Neostapfia colusana*).

² For example, vascular plants listed as rare or endangered or as List 1 or 2 by the California Native Plant Society (CNPS) are considered to meet CEQA Guidelines Section 15380(b) criteria.

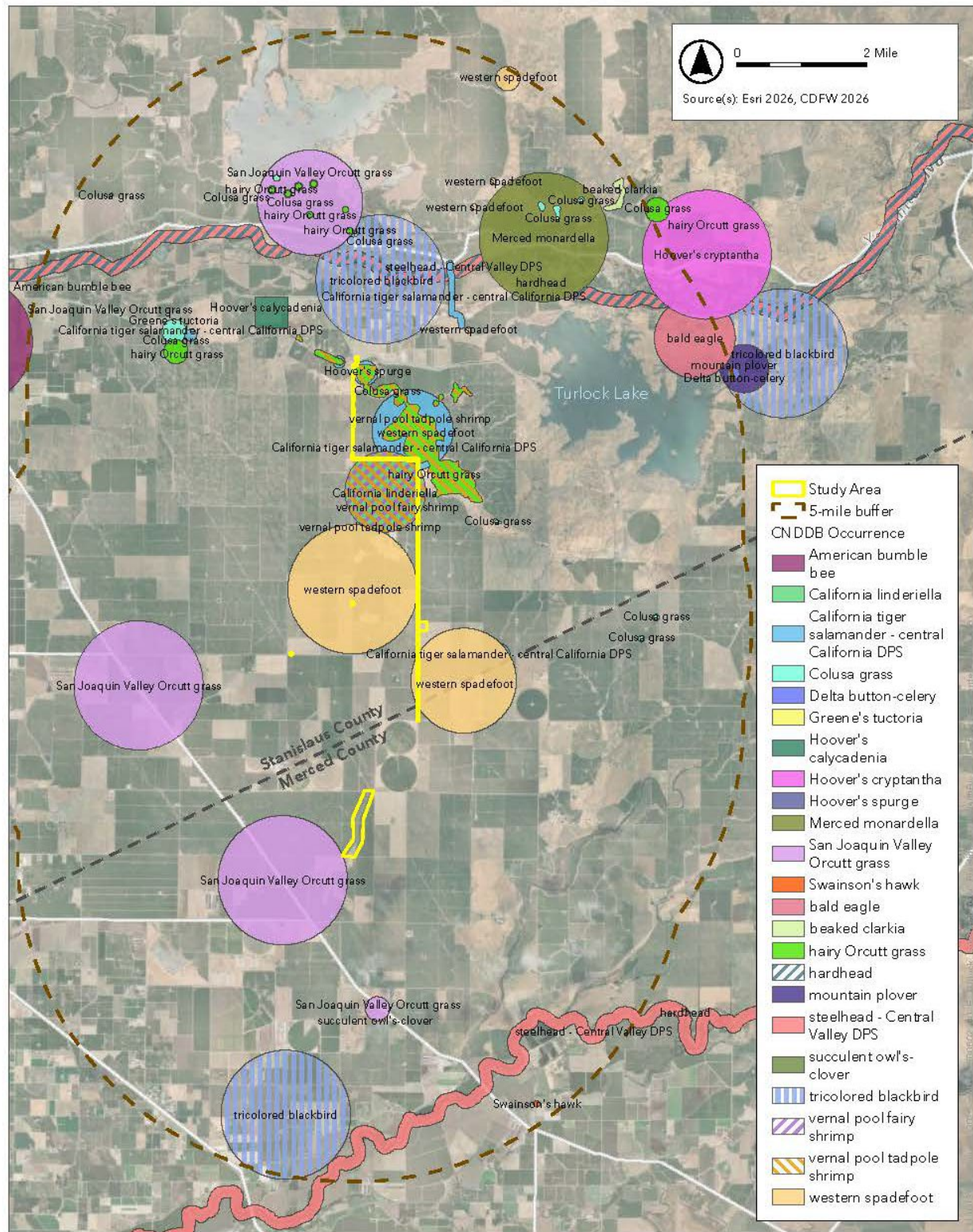


Figure 3
CNDDDB Occurrences



3.4.2 Special-Status Wildlife Species

No special-status wildlife were identified during the December 1 and 2, 2025 and May 4, 2026, biological reconnaissance surveys of the Study Area.

Based on the habitat types and conditions within the Study Area, along with review of background information and database searches, a variety of special-status wildlife species have potential to occur in the Study Area and are listed in Appendix B. From this list, 25 special-status wildlife species were determined to have a low to no potential to occur within the Study Area and low potential to be affected by the project: bald eagle (*Haliaeetus leucocephalus*), burrowing owl (*Athene cunicularia*), California horned lark (*Eremophila alpestris actia*), least Bell's vireo (*Vireo bellii pusillus*), mountain plover (*Charadrius montanus*), Swainson's hawk (*Buteo swainsoni*), California linderiella (*Linderiella occidentalis*), conservancy fairy shrimp (*Branchinecta conservancy*), midvalley fairy shrimp (*Branchinecta mesovallensis*), vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardii*), hardhead (*Mylopharodon conocephalus*), steelhead - Central Valley DPS (*Oncorhynchus mykiss irideus pop. 11*), Antioch multilid wasp (*Myrmosula pacifica*), Crotch bumble bee (*Bombus crotchii*), molestan blister beetle (*Lytta molesta*), monarch - California overwintering population (*Danaus plexippus plexippus pop. 1*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), Merced kangaroo rat (*Dipodomys heermanni dixonii*), pallid bat (*Antrozous pallidus*), San Joaquin kit fox (*Vulpes macrotis mutica*), western mastiff bat (*Eumops perotis californicus*), western red bat (*Lasiurus frantzii*), Northern California legless lizard (*Anniella pulchra*), and Northwestern pond turtle (*Actinemys marmorata*).

From this list, three special-status wildlife species were determined to have a moderate to high potential to occur within the Study Area and potential to be affected by the project: California tiger salamander - central California DPS (*Ambystoma californiense pop. 1*), western spadefoot (*Spea hammondi*), and tricolored blackbird (*Agelaius tricolor*). These three species are discussed below.

California Tiger Salamander – Central California DPS

California tiger salamanders are a species found throughout the Central Valley and central coast of California and are federally and state threatened. This species spends most of its life underground in small mammal burrows. They emerge to breed during the wet season. Breeding occurs in temporary pools, such as vernal pools that persist for a minimum of 10 weeks, but may also breed in slower parts of streams and some permanent waters. Multiple suitable burrows for California tiger salamander were observed onsite ranging from less than 1 inch to 4 inches in diameter. Historical CNDDB records indicate the most recent observation was in the vernal pools along Hickman Road, adjacent to Rainbow farms in 2003.

Western Spadefoot

Western spadefoot toads are a species found throughout the Central Valley and surrounding foothills and are a federally proposed threatened and California species of special concern. Some populations persist for a few years in orchard or vineyard habitats. Breeding occurs in shallow, temporary pools formed by heavy winter rain. Western spadefoot spend most of the year in self-excavated burrows but are also known to take cover in small mammal burrows. Multiple suitable burrows for western spadefoot were observed onsite ranging from less than 1 inch to 4 inches in diameter. Historical CNDDB records indicate the most recent observation was in the vernal pools along Hickman Road, adjacent to Rainbow farms in 1991 but is presumed extant so cannot be ruled out.

Tricolored Blackbird

Tricolored blackbirds historically nested in wetlands, however, have adapted to nesting in agricultural fields. A small area of freshwater emergent wetland is present in the Study Area on Hickman Road just south of Lake Road. This wetland contains cattails, rushes, and willows suitable for tricolored blackbird nesting. Historical CNDDDB records east of Turlock Lake indicate the species is presumed extant.

3.5 Wildlife Movement Corridors

Wildlife movement corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or by areas of human disturbance or urban development. Topography and other natural factors in combination with urbanization can fragment or separate large open-space areas. The fragmentation of natural habitat can create isolated “islands” of vegetation and habitat that may not provide sufficient area to accommodate sustainable populations and can adversely impact genetic and species diversity. The retention of wildlife movement corridors ameliorates the effects of such fragmentation by allowing animals to move between remaining habitats, which in turn allows depleted populations to be replenished. Such movement may also promote genetic exchange between separated populations.

The Study Area is currently used for a variety of agricultural purposes. Wildlife that is able to pass through or over the fencing may move through the Study Area from surrounding grasslands/agriculture. The TID Main Canal and Mustang Creek provide corridors for movement throughout the region, though there is no woody plant cover and little forage available.

3.6 Critical Habitat for Listed Fish and Wildlife Species

The USFWS defines the term “critical habitat” in the federal Endangered Species Act as a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. The Study Area is within designated critical habitat at the vernal pools along Hickman Road for several listed plant species.

3.7 Heritage and Protected Trees

The Study Area does not support any heritage or protected trees identified in local tree ordinances for protection and preservation. Only non-protected orchard trees would be removed, trimmed, or damaged during project related work.

CHAPTER 4

Recommendations

Based on the results of ESA's review of background information, sensitive species database searches, the reconnaissance biological surveys, and habitat suitability, the Study Area provides limited suitable habitat for special-status species with the exception of a vernal pool complex located adjacent to Rainbow farms. Appendix B presents the potential to occur for special-status species known to occur in the vicinity of the Study Area. Most of the special-status species evaluated have low potential to occur, or the Study Area does not support suitable habitat. Potential adverse impacts of the project to special-status species and sensitive biological resources identified in this report would be avoided and minimized with implementation of the below recommendations.

4.1 California Tiger Salamander

California tiger salamander is threatened under the FESA and CESA; consultation under Section 7 for federal projects is required; consultation for interagency cooperation is recommended. State-level protections do apply; consultation under Section 10 for an incidental take permit may be necessary. If ground disturbance is scheduled to occur during the breeding season (October-June) Eastside Water District or its contractor may implement the following measures to avoid potential adverse effects to California tiger salamander.

- All project staff will attend a worker environmental awareness training focused on CTS identification and reporting procedures.
- Forty-eight hours prior to ground disturbance, a qualified biologist shall perform protocol-level surveys for California tiger salamander and suitable small mammal burrows within 250 feet, where access is available, per USFWS/CDFW guidance. If pre-activity surveys indicate that California tiger salamander is inactive or potential habitat is unoccupied during the ground disturbance period, no further surveys or avoidance are required.
- For seasonal avoidance of special-status vernal-pool-dependent species (e.g., California tiger salamander), the Contractor will not work within 50-100 feet, or as determined by a qualified biologist, of suitable aquatic habitats (e.g., vernal pools, seasonal wetlands) from October 15 to June 1 (corresponding to the rainy season) or as determined through informal or formal consultation with the USFWS or USACE. Ground-disturbing activities may begin once the habitat is no longer inundated for the season and it is after April 15.
- If pre-activity surveys indicate that California tiger salamander is active or potential habitat is occupied, all initial ground disturbance will require a full-time qualified biological monitor.
- If any work remains to be completed after October 15, the Contractor (under the direction of the Project Biologist) will install exclusion fencing and erosion control measures in those areas where

construction activities need to be completed. The Project Biologist will document compliance through memoranda to the Mitigation Manager during the establishment of the fencing activities.

- If any individuals are encountered, a qualified biologist will relocate them to suitable habitat within the project area, outside the active disturbance zone.

4.2 Western Spadefoot

Western spadefoot is proposed for listing under the FESA; consultation under Section 7 for federal projects is not required but if it were to become listed, consultation for interagency cooperation is recommended. State-level protections do not apply; however, consultation under Section 10 for an incidental take permit may be necessary if it were to be listed. If ground disturbance is scheduled to occur during the breeding season (October-June) Eastside Water District or its contractor may implement the following measures to avoid potential adverse effects to Western spadefoot.

- Forty-eight hours prior to ground disturbance, a qualified biologist shall perform pre-activity surveys for western spadefoot and suitable small mammal burrows within 250 feet, where access is available. If pre-activity surveys indicate that western spadefoot is inactive or potential habitat is unoccupied during the ground disturbance period, no further surveys or avoidance are required.
- For seasonal avoidance of special-status vernal-pool-dependent species (e.g., western spadefoot toads), the Contractor will not work within 50-100 feet, or as determined by a qualified biologists, of suitable aquatic habitats (e.g., vernal pools, seasonal wetlands) from October 15 to June 1 (corresponding to the rainy season) or as determined through informal or formal consultation with the USFWS or USACE. Ground-disturbing activities may begin once the habitat is no longer inundated for the season and it is after April 15.
- If any work remains to be completed after October 15, the Contractor (under the direction of the Project Biologist) will install exclusion fencing and erosion control measures in those areas where construction activities need to be completed. The Project Biologist will document compliance through memoranda to the Mitigation Manager during the establishment of the fencing activities.
- If any individuals are encountered, a qualified biologist will relocate them to suitable habitat within the project area, outside the active disturbance zone.

4.3 Special-Status and Other Nesting Birds

If ground disturbance is scheduled to occur during the avian nesting season (February 1 through September 15), Eastside Water District or its contractor may implement the following measures to avoid potential adverse effects to nesting birds including tricolored blackbird, raptors, including burrowing owl and Swainson's hawk, and other common and special-status nesting birds.

- Twenty-four hours prior to ground disturbance, a qualified biologist shall perform pre-activity surveys for nesting birds within 500 feet, and 0.5 mile for special-status raptors, of the work areas, where access is available. If pre-activity surveys indicate that nests are inactive or potential habitat is unoccupied during the ground disturbance period, no further surveys or avoidance are

required. Trees and shrubs within the construction footprint determined to be unoccupied by nesting birds, or that are outside the no-disturbance buffer for active nests, could be removed.

- If active nests are detected during pre-activity surveys, a no-disturbance buffer around active raptor nests and nests of other special-status birds during the breeding season, or until it is determined that young birds have fledged. Buffers shall be at least 250 feet for raptors and at least 150 feet for other nesting birds. Nests initiated within the active work area may have reduced buffer sizes due to the increased tolerance of disturbance. Reductions to nest buffer distances may be allowed on a case-by-case basis in coordination with the CDFW based on site-specific factors such as the existing disturbance levels, the species of nesting bird, and the magnitude of the proposed disturbance.

4.4 Special-Status Plants

The following measure should be implemented in suitable habitat prior to any ground disturbance to avoid or minimize impacts to special-status plant species:

- Prior to any ground disturbance within or adjacent to wetland and aquatic habitat, a qualified biologist shall conduct pre-construction surveys for special-status plant species in suitable habitat areas subject to ground disturbing activities or within 50 feet of ground disturbing activities. The surveys shall be conducted during bloom season, typically during the months of March and June, and prior to ground-disturbing activities. The biologist shall work with the construction contractor to mark and avoid disturbance of locations of special-status plant species where feasible or prepare a relocation plan if avoidance is infeasible. The relocation plan shall include, but not be limited to, seed and soils collection, plant salvage, suitable relocation sites, monitoring requirements, and success criteria.

4.5 Wetlands and Waters of the U.S. and State, and Lake and Streambed Alteration

An Aquatic Resource Delineation Report has been prepared by ESA (July 2026) for review and verification by USACE. The best strategy to protect wetlands and waters of the U.S. and state would be to avoid impacts to potential jurisdictional areas identified in the aquatic resources delineation. However, if avoidance is not feasible, the following measure should be implemented to protect Waters of the U.S. and state:

1. Clearing of wetland vegetation and ground disturbance in waters and wetlands will be confined to the minimal area necessary for project related impacts.
2. Areas of temporary impacts will be restored to pre-project conditions.
3. Native wetland vegetation should be replaced with the same or similar species known to occur in the area upon completion of ground disturbing activities.
4. Any necessary permits or authorizations (404, 401, CVRWQCB) will be obtained prior to placement of fill or alteration of any regulated waters of the U.S. and state.

5. A Lake and Streambed Alteration Agreement Notification will be submitted to CDFW for impacts to bed, bank, and channel within Mustang Creek

CHAPTER 5

References

- Baldwin, et al. 2012. Jepson Manual: Vascular Plants of California; Second Edition. University of California Press.
- California Department of Fish and Wildlife (CDFW). 2025a. California Natural Diversity Database (CNDDDB) search for the U.S. Geological Survey 7.5-minute Bliss Ranch topographic quadrangle, and surrounding 9 quadrangles. (Commercial Version November 1, 2025) Accessed November 13, 2025. <https://apps.wildlife.ca.gov/rarefind/view/RareFind.aspx>
- California Department of Fish and Wildlife (CDFW). 2025b. California Natural Community List. Accessed November 19, 2025. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153398&inline>.
- California Native Plant Society, Rare Plant Program. *Rare Plant Inventory* [online edition, v9.5.1]. Accessed November 13, 2025. <https://www.rareplants.cnps.org>
- California Wildlife Habitat Relationship Program (CWHR). 2025. California's Wildlife: Life History Accounts and Range Maps. California Wildlife Habitat Relationship System. Department of Fish and Wildlife and California Interagency Wildlife Task Group. Sacramento, CA. Originally published in Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California's Wildlife. Vol. I-III. California Department of Fish and Game, Sacramento, CA. Available: <https://wildlife.ca.gov/Data/CWHR/Life-History-and-Range>. Accessed November 2025.
- Cornell Lab of Ornithology. 2025 All About Birds. *Swainson's Hawk*. Accessed December 13, 2025. https://www.allaboutbirds.org/guide/Swainsons_Hawk/lifehistory#habitat.
- Google Earth. 2025. Aerial imagery of Study Area. Accessed: January 2026. Available: Google Earth Pro application.
- Holland, R.F., 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Vegetation Ecologist Nongame-Heritage Program, Sacramento, CA. Available: <https://www.cal-ipc.org/docs/ip/inventory/pdf/HollandReport.pdf>.
- Jepson Flora Project (Jepson). 2025. Jepson Online Interchange for California floristics. Available: <http://ucjeps.berkeley.edu/interchange.html>.
- National Resources Conservation Service (NRCS). 2025. Soil Survey Geographic Database (SSURGO). Geospatial data accessed from <https://websoilsurvey.nrcs.usda.gov/>. Accessed December 3, 2025.
- U.S. Department of Agriculture. 2025. Web Soil Survey. Available: <http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>. Accessed December 2, 2025.

- U.S. Fish and Wildlife Service. 2025a. National Wetland Inventory.
<https://www.fws.gov/wetlands/data/Mapper.html>. Accessed November 17, 2025.
- . 2026b. Information for Planning and Consultation (IPaC). Species list generated January 21, 2026. <https://ecos.fws.gov/ipac/>.

Appendix A

National Wetland Inventory Map

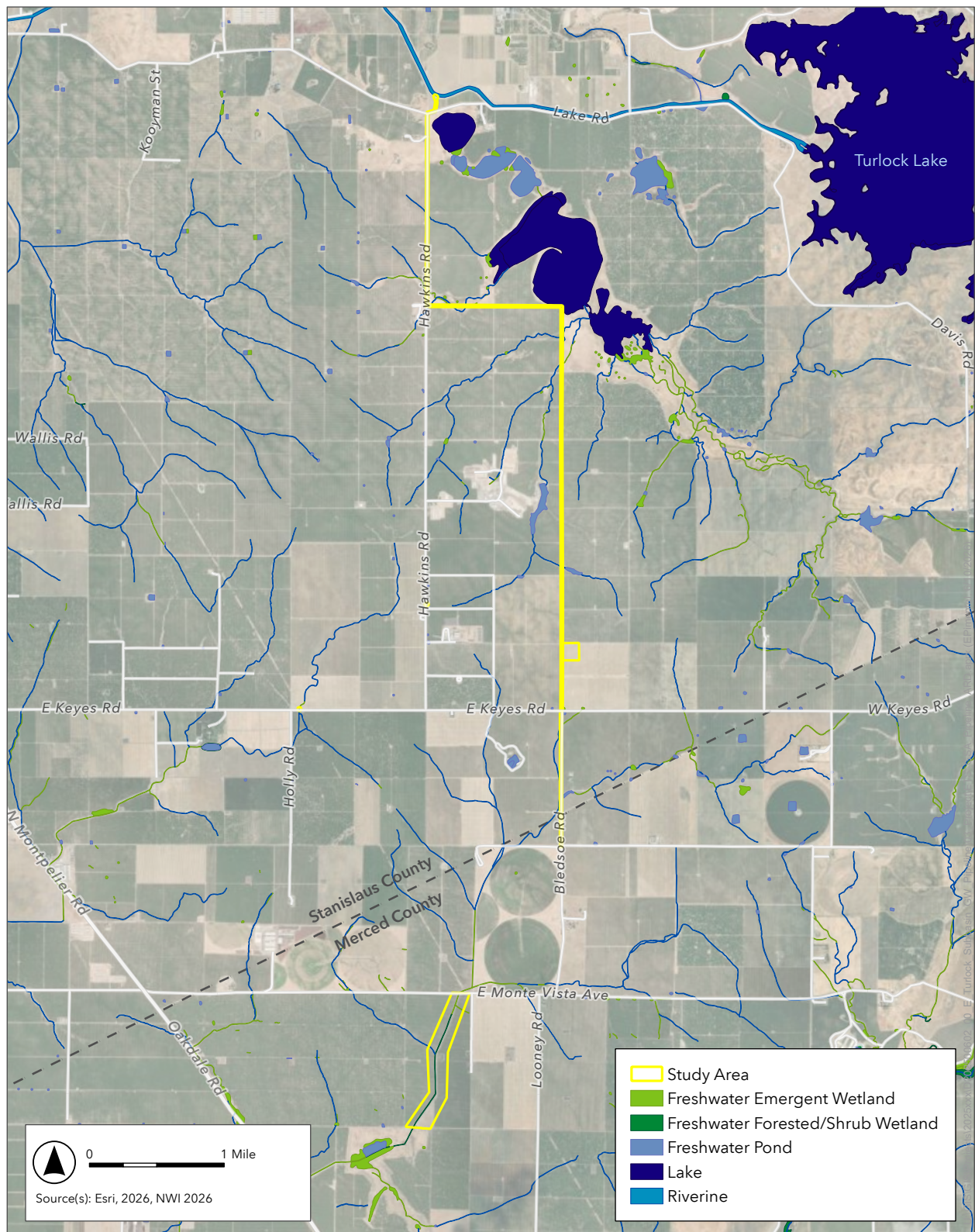


Figure 4
National Wetlands Inventory

Appendix B

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

SPECIAL-STATUS SPECIES CONSIDERED IN THE STUDY AREA

Organism	Taxonomy	Common Name <i>Scientific Name</i>	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
Plants	Dicots	beaked clarkia <i>Clarkia rostrata</i>	-/-	1B.3	BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_UCBG-UC Botanical Garden at Berkeley	Annual herb found in cismontane woodlands, valley and foothill grasslands from 195 to 1640 feet. Known from Calaveras, Madera, Merced, Mariposa, Stanislaus, and Tuolumne counties.	April-May	None. Habitat not present in Study Area.
		Delta button-celery <i>Eryngium racemosum</i>	-/CE	1B.1	-	Annual/perennial herb found in riparian scrub (vernally mesic clay depressions) from 10 to 100 feet. Known from Calaveras, Contra Costa, Merced, San Joaquin, and Stanislaus counties.	(May)June-October	None. Study Area above elevation.
		dwarf downingia <i>Downingia pusilla</i>	-/-	2B.2	-	Annual herb found in valley and foothill grassland (mesic sites), and vernal pools from 5 to 1460 feet. Known from Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties.	March-May	Low. Minimal habitat within the Study Area. All records more than 7 miles away.

Organism	Taxonomy	Common Name Scientific Name	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
		forked hare-leaf <i>Lagophylla dichotoma</i>	-/-	1B.1	-	Annual herb found in Cismontane woodland, valley and foothill grassland, sometimes in clay, from 150 to 1100 feet. Known from Calaveras, Fresno, Merced, and Stanislaus counties.	April-May	Low. Minimal habitat within the Study Area. All records more than 8 miles away.
		Hartweg's golden sunburst <i>Pseudobahia bahiifolia</i>	FE/CE	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Annual herb found in Valley and foothill grassland, and cismontane woodland, often acidic, sometimes in clay. Known from Fresno, Madera, Merced, Stanislaus, Sutter, Tuolumne, and Yuba counties.	March-April	Low. Minimal habitat within the Study Area. All records more than 8 miles away concentrated in foothill grasslands.
		heartscale <i>Atriplex cordulata</i> var. <i>cordulata</i>	-/-	1B.2	BLM_S-Sensitive	Annual herb found in Chenopod scrub, Meadows and seeps, sandy Valley and foothill grassland from 0 to 785 feet, sometimes in Alkaline conditions. Known from Alameda, Butte, Contra Costa, Colusa, Fresno, Glenn, Kern, Madera, Merced, San Joaquin, San Luis Obispo, Stanislaus, Tulare, Yolo counties	April-October	Low. Minimal habitat within the Study Area. All records more than 11 miles away. Closest record has not been observed since 1936.

Organism	Taxonomy	Common Name <i>Scientific Name</i>	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
		Hoover's calycadenia <i>Calycadenia hooveri</i>	-/-	1B.3	BLM_S-Sensitive	Annual herb found in cismontane woodlands and valley and foothill grasslands, in rocky areas from 215 to 985 feet. Known from Calaveras, Madera, Merced, Mariposa, San Joaquin, and Stanislaus counties.	July-September	Low. Minimal habitat within the Study Area. Historical record from 1976 is possibly extirpated due to the area being converted to greenhouses/agriculture.
		Hoover's cryptantha <i>Cryptantha hooveri</i>	-/-	1A	-	Annual herb found in valley and foothill grassland and inland dunes from 30 to 490 feet elevation. Known from Contra Costa, Madera, Sacramento, and Stanislaus counties.	April-May	Low. Minimal habitat within the Study Area. Historical record from 1937 is possibly extirpated due to the area being converted to greenhouses/agriculture and is approximately 4 miles away from the Study Area.
		Hoover's spurge <i>Euphorbia hooveri</i>	FT/-	1B.2	-	Annual herb found in Vernal pools from 80 to 820 feet. Known from Butte, Glen, Merced, Stanislaus Tehama, and Tuolumne counties.	May-June	Moderate. Two historical records from 1986 are less than 0.5 miles from the Study Area; last observed in vernal pools.
		Merced monardella <i>Monardella leucocephala</i>	-/-	1A	-	Annual herb found in Valley and foothill grasslands, in mesic and sandy conditions from 115 to 330 feet. Known from Merced and Stanislaus counties.	May-August	Low. Minimal habitat within the Study Area. All records more than 3 miles away and habitat has been converted to agricultural lands.

Organism	Taxonomy	Common Name Scientific Name	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
		subtle orache <i>Atriplex subtilis</i>	-/-	1B.2	BLM_S-Sensitive	Annual herb found in valley and foothill grassland, sometimes in alkaline conditions from 130 to 330 feet elevation. Known from Butte, Fresno, Kings, Kern, Madera, Merced, Stanislaus, and Tulare counties.	June-September (April) (October)	Low. Minimal habitat within the Study Area. One nearby record from 1936 is more than 13 miles away and habitat has been converted to agricultural lands.
		succulent owl's-clover <i>Castilleja campestris</i> var. <i>succulenta</i>	FT/CE	1B.2	-	Hemiparasitic annual herb found in vernal pools, often in acidic conditions from 165 to 2460 feet. Known from Fresno, Madera, Merced, Mariposa, San Joaquin, and Stanislaus counties.	April-May (March)	Low. Minimal habitat within the Study Area. One nearby record from 1937 is more than 2 miles away and other records aggregated to the west in grasslands.
	Monocots	Colusa grass <i>Neostapfia colusana</i>	FT/CE	1B.1	-	Annual herb found in vernal pools, sometimes in adobe clay, from 15 to 655 feet in elevation. Known from Colusa, Glenn, Merced, Solano, Stanislaus, and Yolo counties.	May-August	Moderate. Historical records from 2010 indicate plants present in Hickman verna pools adjacent to the Study Area.
		Greene's tuctoria <i>Tuctoria greenei</i>	FE/CR	1B.1	-	Annual herb found in vernal pools from 100 to 3510 feet. Known from Butte, Fresno, Glenn, Madera, Merced, Modesto, Shasta, San Joaquin, Stanislaus, Tehama, and Tuolumne counties.	May-July(September)	None. Last observed 1958 and extirpated since 1980. Land has been converted to vineyard.

Organism	Taxonomy	Common Name Scientific Name	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
		hairy Orcutt grass <i>Orcuttia pilosa</i>	FE/CE	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Annual herb found in vernal pools from 150 to 655 feet. Known from Glenn, Madera, Merced, Stanislaus, and Tehama counties.	May-September	Low. Minimal habitat within the Study Area. Historical records of observations in the Hickman ponds are isolated to the most northern pools near Lake Road and Hickman Road.
		San Joaquin Valley Orcutt grass <i>Orcuttia inaequalis</i>	FT/CE	1B.1	-	Annual herb found in vernal pools from 35 to 2475 feet. Known from Fresno, Madera, Solano, Stanislaus, and Tuolumne counties.	April-September	None. The Study Area provides no habitat. All historical record locations are extirpated due to extensive land conversion.
Wildlife	Amphibians	California tiger salamander - central California DPS <i>Ambystoma californiense</i> pop. 1	FT/CT	-	CDFW_WL-Watch List IUCN_VU-Vulnerable	Frequents grassland, oak savannah, and edges of mixed woodland and lower elevation coniferous forest. Spends much time underground in mammal burrows. Usually breeds in temporary ponds such as vernal pools, but may also breed in slower parts of streams and some permanent waters. Ponds with large populations of California tiger salamander larvae usually contain very few larvae of other amphibian species. Requires long-lasting vernal pools to	-	Moderate. Historical records from 2003 indicate two individuals were observed present in northern Hickman vernal pools adjacent to the Study Area.

Organism	Taxonomy	Common Name Scientific Name	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
						complete larval development of a minimum of approximately 10 weeks. Adults can migrate up to 1.5 mi from breeding ponds in upland habitat.		
		western spadefoot <i>Spea hammondi</i>	FPT/-	-	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened	Occurs throughout the Central Valley and adjacent foothills primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying. Most of the year is spent in underground burrows up to 36 inches deep, which they construct themselves.	-	Moderate. Historical records from 1991 indicate an observation and are presumed extant. Observed present in the central Hickman vernal pool but may extend throughout the entire vernal pool complex.
	Birds	bald eagle <i>Haliaeetus leucocephalus</i>	FD/CE	-	BLM_S-Sensitive CDF_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern USFS_S-Sensitive	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.	-	None. Habitat not present in Study Area.

Organism	Taxonomy	Common Name <i>Scientific Name</i>	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
		burrowing owl <i>Athene cunicularia</i>	-/CCE	-	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	Nests and forages in grasslands, agricultural fields, and low scrub habitats, especially where ground squirrel burrows are present; occasionally inhabit artificial structures and small patches of disturbed habitat.	-	Low. Minimal habitat within the Study Area. Historical records present more than 12 miles away aggregated in grasslands.
		California horned lark <i>Eremophila alpestris actia</i>	-/-	-	CDFW_WL-Watch List IUCN_LC-Least Concern	Occur in bare, dry ground and areas of short, sparse vegetation; they avoid places where grass grow more than a couple of inches high. Common habitats include prairies, deserts, tundra, beaches, dunes, and heavily grazed pastures.	-	Low. Minimal habitat within the Study Area. Historical records present more than 8 miles away aggregated in foothill grasslands.

Organism	Taxonomy	Common Name <i>Scientific Name</i>	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
		least Bell's vireo <i>Vireo bellii pusillus</i>	FE/CE	-	NABCI_YWL-Yellow Watch List	Occur in many kinds of dense shrubby or scrubby habitat, including brushy fields, early successional growth, riverine scrub, coastal chaparral, scrub oak, mottes (isolated patches) of shrubs and trees in prairies, saltcedar stands, and mesquite bosques. Especially in arid regions, Bell's Vireos are found along streams or in dry arroyos and gulches.	-	None. Habitat not present in Study Area.
		mountain plover <i>Anarhynchus montanus</i>	-/-	-	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	Species is found in short grasslands, freshly plowed fields, newly sprouting grain fields, and sometimes sod farms. Winters in central and southern California primarily from September to mid-March; does not breed in California.	-	Low. Minimal habitat within the Study Area. A historical record from 2022 shows the species present more than 4 miles away at Turlock Lake.

Organism	Taxonomy	Common Name Scientific Name	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
		Swainson's hawk <i>Buteo swainsoni</i>	-/CT	-	BLM_S-Sensitive IUCN_LC-Least Concern	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	-	Low. Minimal habitat within the Study Area. A historical record from 1919 is presumed extant but is contained closed to La Grange.
		tricolored blackbird <i>Agelaius tricolor</i>	-/CT	-	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_EN- Endangered NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	Forages on ground in cropland and grassland. Nests near or over freshwater. Prefers emergent marsh of dense cattails or tules for nesting, but also nests in thickets of willow, blackberry, wild rose, and tall herbs. Nesting area must be large enough to support a minimum colony of about 50 pairs. Occurs primarily in the Central Valley and in coastal areas south of Sonoma County.	-	Moderate. Potential habitat present on Study Area Hawkins Rd just south of Lake Rd. Historical records of presumed extant colonies present just west of Turlock Lake.

Organism	Taxonomy	Common Name <i>Scientific Name</i>	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
	Crustaceans	California linderiella <i>Linderiella occidentalis</i>	-/-	-	IUCN_NT-Near Threatened	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions.	-	Low. Potential habitat within historical range has mostly been converted to orchards. Last observed in 1998 and presumed possibly extirpated.
		Conservancy fairy shrimp <i>Branchinecta conservatio</i>	FE/-	-	IUCN_EN- Endangered	Species is endemic to the grasslands of the northern two- thirds of the Central Valley and found in large, turbid pool where vegetation is absent.	-	None. No habitat present within the Study Area. Historical records are restricted more than 20 miles south of the Study Area.
		midvalley fairy shrimp <i>Branchinecta mesovallensis</i>	-/-	-	Global Rank G - Imperiled State Rank S2S3 - Imperiled; Vulnerable	Species is found in vernal pools and wetlands in the Central Valley.	-	None. No habitat present within the Study Area. Historical records are restricted more than 10 miles south of the Study Area.
		vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT/-	-	IUCN_VU-Vulnerable	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.	-	Low. Potential habitat within historical range has mostly been converted to orchards. Last observed in 1986 and presumed possibly extirpated.

Organism	Taxonomy	Common Name Scientific Name	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
		vernal pool tadpole shrimp <i>Lepidurus packardii</i>	FE/-	-	IUCN_EN- Endangered	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed & highly turbid.	-	Low. Potential habitat within historical range has mostly been converted to orchards. Last observed in 1986 and presumed possibly extirpated.
	Fish	hardhead <i>Mylopharodon conocephalus</i>	-/-	-	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	Hardhead are often found at low to mid elevations in relatively undisturbed habitats of larger streams with high water quality (clear, cool).	-	None. Habitat not present in Study Area.
		steelhead - Central Valley DPS <i>Oncorhynchus mykiss irideus pop. 11</i>	FT/-	-	CDFW_SSC-Species of Special Concern AFS_TH-Threatened	This DPS enters the Sacramento and San Joaquin Rivers and their tributaries from July to May; spawning from December to April. Young move to rearing areas in and through the Sacramento and San Joaquin Rivers, Delta, and San Pablo and San Francisco Bays.	-	None. Habitat not present in Study Area.
	Insects	Antioch multilid wasp <i>Myrmosula pacifica</i>	-/-	-	Global Rank GH-historical State Rank SH-historical	Occurs in interior dunes at Antioch and San Joaquin Valley.	-	None. Habitat not present in Study Area.

Organism	Taxonomy	Common Name <i>Scientific Name</i>	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
		Crotch bumble bee <i>Bombus crotchii</i>	-/-	CCE	IUCN_EN- Endangered	May inhabit open grassland and scrub. Current range is primarily adjacent foothills around the Central Valley. Largely extirpated from agricultural and urban areas of the Central Valley.	-	Low. Observations from 2024 less than 7 miles northeast of the northern portion of the Study Area.
		molestan blister beetle <i>Lytta molesta</i>	-/-	-	Global Rank G2- Imperiled State Rank S2- Imperiled	Inhabits vernal pools and wetlands of Central Valley of California, from Contra Costa to Kern and Tulare counties. They can be found on flowers such as <i>Lupinus</i> spp.	-	None. Minimal habitat present in Study Area. Historical record from unknown year is more than 10 miles southeast. Historical record restricted to annual grassland habitat.

Organism	Taxonomy	Common Name Scientific Name	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
		monarch - California overwintering population <i>Danaus plexippus</i> <i>plexippus pop. 1</i>	FPT/-	-	IUCN_EN- Endangered USFS_S-Sensitive	Overwinters within wind-protected groves of trees (primarily Monterey pine [<i>Pinus radiata</i>], Monterey cypress [<i>Hesperocyparis macrocarpa</i>], and eucalyptus [<i>Eucalyptus</i> spp.]) along California coast from northern Mendocino County south to Baja California typically near water and nectar sources. During the breeding season, the required host plant is milkweed (<i>Asclepias</i> spp.) for development, egg deposition, and nectar.	-	None. Habitat and host plant not present on the Study Area.
		valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	FT/-	-	-	Occurs only in the Central Valley of California, in association with blue elderberry (<i>Sambucus nigra</i> ssp. <i>caerulea</i>). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for "stressed" elderberries.	-	None. No blue elderberry was observed in the Study Area.

Organism	Taxonomy	Common Name <i>Scientific Name</i>	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
		Merced kangaroo rat <i>Dipodomys heermanni dixonii</i>	-/-	-	Global Rank G4T2- Species Apparently Secure, Subspecies Imperiled State Rank S2- Imperiled	Grassland and savanna communities in eastern Merced and Stanislaus counties. Needs fine, deep, well-drained soil for burrowing. Granivorous, but also eats forbs and green grasses.	-	Low. Minimal habitat within the Study Area. A historical record more than 9 miles away from 1915 is presumed extant but is contained closer to foothill grasslands.
		pallid bat <i>Antrozous pallidus</i>	-/-	-	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S- Sensitive	Occurs in low elevations in California. A wide variety of habitats are occupied, including grasslands, shrublands, woodlands, and forests from sea level up through mixed conifer forests. The species is most common in open, dry habitats with rocky areas for roosting. Day roosts are in caves, crevices, mines, and occasionally in hollow trees and buildings.	-	Low. Minimal habitat within the Study Area. A historical record more than 6 miles away from 1999 is presumed extant but is contained closer to La Grange.

Organism	Taxonomy	Common Name <i>Scientific Name</i>	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
		San Joaquin kit fox <i>Vulpes macrotis mutica</i>	FE/CT	-	-	Deserts and grasslands in the San Joaquin Valley; Chenopod scrub, Valley & foothill grassland.	-	Low. Minimal habitat present in Study Area. Most recent historical record observed in 1999 more than 9 miles south in Atwater. Habitat mostly converted to residential but presumed extant.
		western mastiff bat <i>Eumops perotis californicus</i>	-/-	-	BLM_S-Sensitive CDFW_SSC-Species of Special Concern	Uncommon resident in southeastern San Joaquin Valley and Coastal Ranges from Monterey County southward through southern California, from the coast eastward to the Colorado Desert. Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and urban. Crevices in cliff faces, high buildings, trees, and tunnels are required for roosting.	-	Low. Minimal habitat present in Study Area. Most recent historical record from 1999 is more than 9 miles south at the Merced River.

Organism	Taxonomy	Common Name Scientific Name	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
		western red bat <i>Lasiurus frantzii</i>	-/-	-	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	Roosts primarily in trees, 2-40 ft above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging. Occurs in cismontane woodlands, lower montane coniferous forest, riparian forests, and riparian woodlands.	-	Low. Minimal habitat present in Study Area. Most recent historical record from 1999 is more than 9 miles south at the Merced River.
	Reptiles	Northern California legless lizard <i>Anniella pulchra</i>	-/-	-	CDFW_SSC-Species of Special Concern USFS_S-Sensitive	Usually forages at the base of shrubs or other vegetation either on the surface or just below it in leaf litter or sandy soil. Sometimes seek cover under surface objects such as flat boards and rocks where they lie barely covered in loose soil. They are often encountered buried in leaf litter and commonly burrow near the surface through loose soil	-	Low. Minimal habitat present in Study Area. Most recent historical record from 2014 is more than 9 miles south in Delhi.

Organism	Taxonomy	Common Name <i>Scientific Name</i>	Status Federal/ State	CNPS Status	Other Status	Habitat	Identification/ Survey Period	Potential to Occur
		Northwestern pond turtle <i>Actinemys marmorata</i>	FPT/-	-	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFS_S-Sensitive	Highly aquatic species found in a broad range of aquatic habitats including rivers and streams, permanent lakes, ponds, reservoirs, settling ponds, marshes, and other inundated wetlands. May use brackish, semi- permanent, or ephemeral features when inundated. Requires basking sites and loose soil in surrounding uplands suitable for nest excavation. Occurs throughout non-desert California from 0 to 6,700 feet.	-	None. No habitat present within the Study Area.
Sensitive Natural Communities		Northern Hardpan Vernal Pool		S3.1		Occurs in vernal pools and wetlands.		Moderate. Historical records indicate the Hickman vernal pools are northern hardpan vernal pools.

KEY TO STATUS CODES:

Federal

Candidate = FC
 Delisted = FD
 Endangered = FE
 None = -
 Proposed Endangered = FPE
 Proposed Threatened = FPT
 Threatened = FT

State

Candidate Endangered = CCE
 Candidate Threatened = CCT
 Delisted = CD
 Endangered = CE
 None = -
 Rare = CR
 Threatened = CT

Other**CNPS Rank Categories:**

1A = Plants presumed extirpated in California and either rare or extinct elsewhere
 1B = Plants Rare, Threatened, or Endangered in California and elsewhere
 2A = Plants presumed extirpated in California, but more common elsewhere
 2B = Plants Rare, Threatened, or Endangered in California, but more common elsewhere
 3 = Plants about which more information is needed - A Review List
 4 = Plants of limited distribution - A Watch List

CNPS Code Extensions:

.1 = Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)
 .2 = Fairly endangered in California (20U+002d80% occurrences threatened)
 .3 = Not very endangered in California (less than 20% of occurrences threatened or no current threats known)

Sources: CNPS 2026; USFWS 2026; CDFW 2026

Appendix C

Aquatic Resources Delineation Report

FINAL

EASTSIDE AQUIFER RESTORATION INITIATIVE

Aquatic Resources Delineation Report

Prepared for
Davids Engineering, Inc

July 2026



FINAL

EASTSIDE AQUIFER RESTORATION INITIATIVE

Aquatic Resources Delineation Report

Prepared for
Davids Engineering, Inc

July 2026

2600 Capitol Avenue
Suite 200
Sacramento, CA 95816
916.564.4500
esassoc.com



Bend	Pasadena	San Francisco
Irvine	Pensacola	San Jose
Los Angeles	Petaluma	Santa Barbara
Mobile	Portland	Sarasota
Oakland	Rancho Cucamonga	Seattle
Orlando	Sacramento	Tampa
Palm Beach County	San Diego	Thousand Oaks

CONTENTS

Eastside Aquifer Restoration Initiative

	<u>Page</u>
Acronyms and Other Abbreviations	iii
Executive Summary	ES-1
Chapter 1. Introduction	1-1
1.1 Survey Location.....	1-1
1.2 Contact Information	1-4
Chapter 2. Existing Conditions	2-1
2.1 Study Area.....	2-1
2.2 Vegetation Communities and Land Cover Types	2-1
2.3 Soils.....	2-2
2.4 Hydrology	2-3
2.5 Climate	2-4
Chapter 3. Regulatory Framework	3-1
3.1 Waters of the United States	3-1
3.2 Waters of the State.....	3-3
3.3 Rivers, Streams, and Lakes	3-5
Chapter 4. Methodology	4-1
4.1 Pre-survey Review	4-1
4.2 Survey Methods	4-1
Chapter 5. Results.....	5-1
5.1 Aquatic Resources	5-1
5.2 Waters of the United States	5-1
5.3 Waters of the State.....	5-4
5.4 Rivers, Streams, and Lakes	5-5
5.5 Conclusions.....	5-5
Chapter 6. References Cited.....	6-1
 Figures	
Figure 1 Regional Location.....	1-2
Figure 2 Project Vicinity.....	1-3
Figure 3 Topographic Map	1-5
Figure 4 National Wetlands Inventory	4-2

Tables

Table 2-1	Study Area Soils	2-2
Table 2-2	Antecedent Precipitation Tool Results for the Project Site on December 1, 2025	2-4
Table 5-1	Potential Waters of the United States	5-2

Appendices

A.	Soils Report
B.	Climatological Data
C.	Data Sheets
D.	Representative Photographs
E.	ORM Aquatic Resources Spreadsheet
F.	Aquatic Resources Figures

Acronyms and Other Abbreviations

Abbreviation	Definition
1987 Manual	<i>1987 Corps of Engineers Wetland Delineation Manual</i>
APT	Antecedent Precipitation Tool
Arid West Supplement	<i>Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)</i>
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CSC	continuous surface connection
CWA	Clean Water Act
EPA	U.S. Environmental Protection Agency
ESA	Environmental Science Associates
GSA	Groundwater Sustainability Agency
NHD	National Hydrography Dataset
NOAA	National Oceanic and Atmospheric Administration
NRCS	U.S. Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	ordinary high-water mark
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
RPS	Relatively Permanent Standard
RWQCB	Regional Water Quality Control Board
State Water Board	State Water Resources Control Board
State Wetland Definition and Procedures	<i>State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State</i>
TNW	Traditional Navigable Water
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USGS	U.S. Geological Survey
WOTUS	Waters of the United States
WDR	Waste Discharge Requirement

This page intentionally left blank

EXECUTIVE SUMMARY

At the request of Davids Engineering, Inc (client), Environmental Science Associates (ESA) conducted a site investigation for the Eastside Water District - Eastside Aquifer Restoration Initiative Project of the 118-acre study area located in Stanislaus County, California, within the Turlock Subbasin and Middle San Joaquin-Lower Merced-Lower Stanislaus Watershed. The purpose of the site investigation was to identify and delineate potential wetlands and other waters of the United States and state on the project site, as well as on-site resources that are protected under Section 1600 et seq. of the California Fish and Game Code, to support any necessary permits from the regulatory agencies.

Based on the results of the aquatic resources delineation and the jurisdictional analysis, it is presumed that 0.681 acres (5,572 linear feet) of potential other (non-wetland) waters of the United States and state occur within the study area. In addition, 0.38 acres of potential wetland waters of the state and additional 0.21 acres of potential other (non-wetland) waters of the state occur within the study area. Finally, it is presumed that 1.187 acres of stream and associated riparian habitat occurring within the study area are potentially protected under Section 1600 et seq. of the California Fish and Game Code.

This page intentionally left blank

CHAPTER 1

Introduction

Environmental Science Associates (ESA) conducted an aquatic resources delineation for the Eastside Water District - Eastside Aquifer Restoration Initiative (Project). The project is designed to enhance groundwater sustainability in the Turlock Subbasin by expanding the delivery of replenishment water from Turlock Irrigation District (TID) to Eastside Water District (EWD) during above-normal or wet years. The Project would involve building a new turnout on the TID Main Canal, pump station, a regulating basin, and approximately 34,900 linear feet of conveyance pipeline to a turnout in Mustang Creek, then through the creek including a one-mile section of re-channelization to Mustang Lake. Replenishment water would be used in-lieu of groundwater pumping during the irrigation season and for direct groundwater recharge through flood managed aquifer recharge (Flood MAR), dedicated recharge basins, incidental recharge, and managed recharge facilities during the non-irrigation season. Replenishment water would be delivered to existing farmland at varying locations utilizing connections to both existing and new infrastructure. These replenishment water deliveries help reduce groundwater pumping during the irrigation season and enhance direct aquifer recharge through Flood MAR or recharge basins during the non-irrigation season in the Turlock Subbasin.

The purpose of the delineation was to determine the extent of state and federal jurisdiction within each study area potentially subject to regulation by the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act (CWA); the Central Valley Regional Water Quality Control Board (RWQCB) pursuant to Section 401 of the CWA and the Porter-Cologne Water Quality Control Act (Porter-Cologne Act); and California Department of Fish and Wildlife (CDFW) under Section 1602 of the California Fish and Game Code.

This aquatic resources delineation report (ARDR) was prepared in accordance with the USACE Recommended Minimum *Standards for Aquatic Resources Delineation Reports* (USACE 2025a), A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (USACE 2008a), Recording Aquatic Resource Delineations Using Global Navigation Satellite Systems (USACE 2025b) and the *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program* (USACE 2016).

1.1 Survey Location

The study area lies in eastern Stanislaus and Merced Counties, east of Montpelier Road (County Highway J9), south of the TID Main Canal, and north of the Merced River (**Figure 1, Figure 2**).

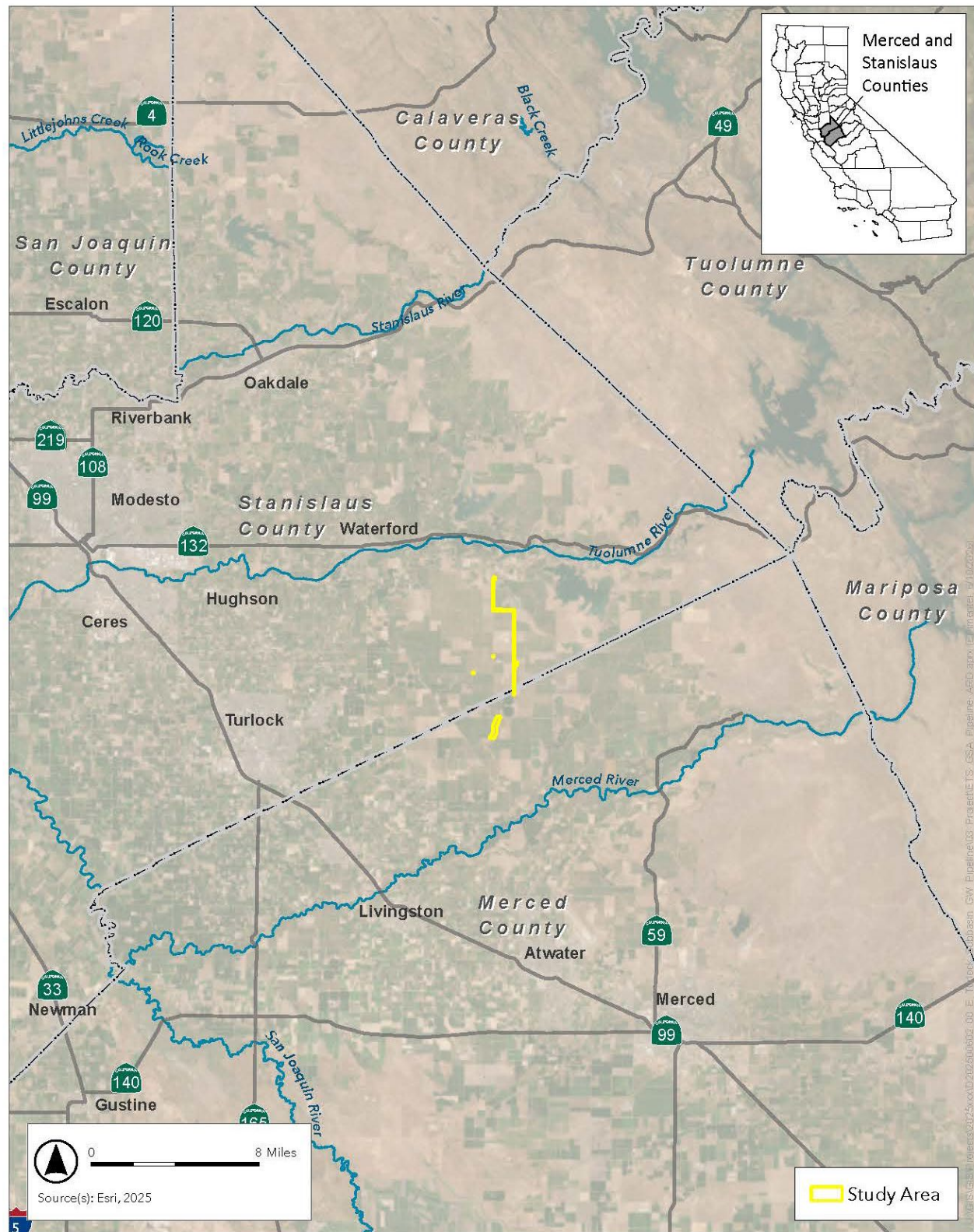


Figure 1
Regional Location



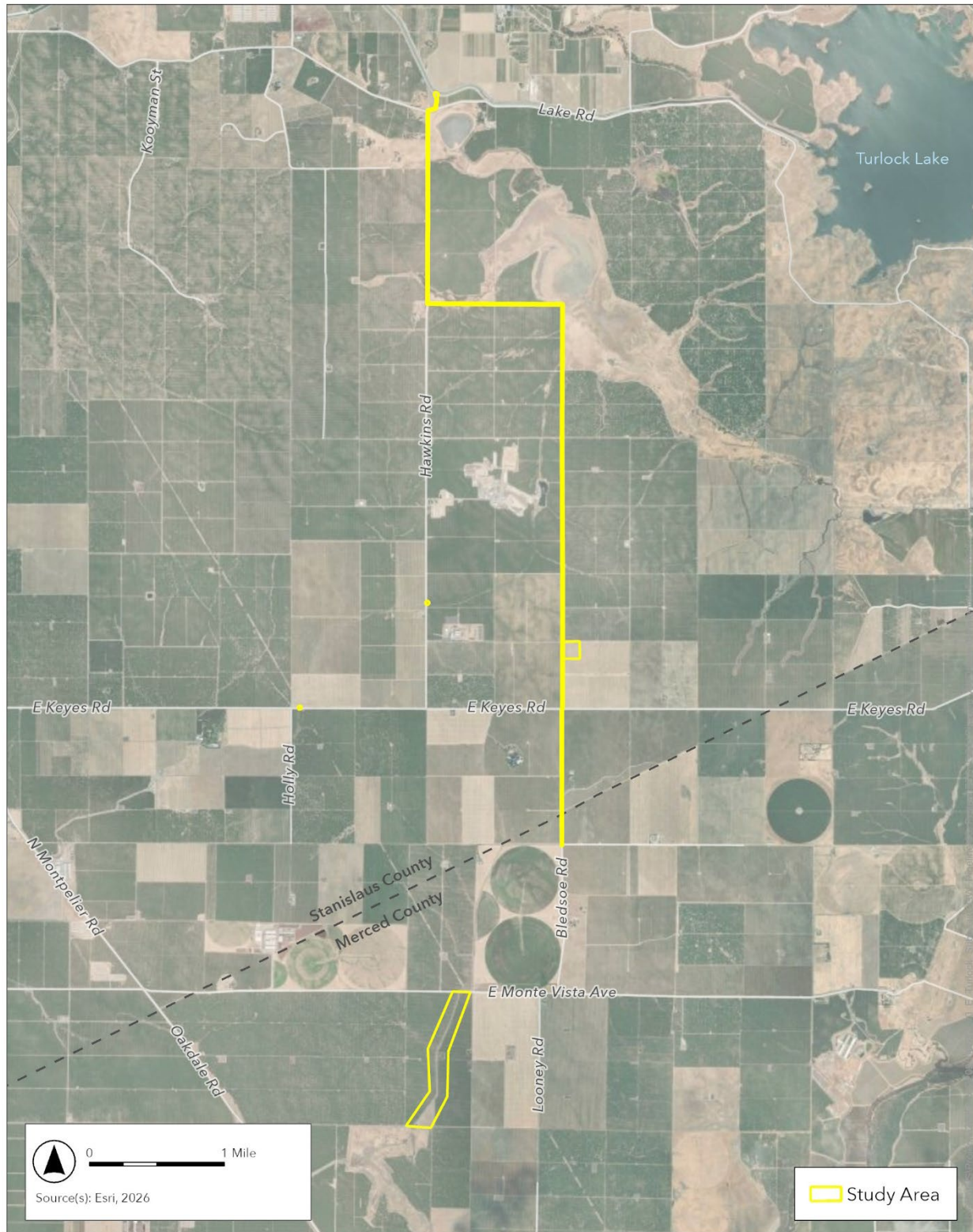


Figure 2
Project Vicinity



The Project is located on the Montpelier USGS 7.5-minute quadrangle, centered roughly 9 miles southeast of Waterford and 12.8 miles northeast of Turlock. It occupies Section 24 of Township 2 North, Range 12 East (Mount Diablo Meridian) and is bordered by Hawkins Road to the west and Bledsoe Road to the east. Surrounding land uses consist entirely of privately owned orchards and agricultural fields. See **Figure 3** for the USGS topo map for the Project area.

1.1.1 Directions to the Study Area

The study area is approximately centered roughly 9 miles southeast of Waterford and 12.8 miles northeast of Turlock. To drive to the study area, navigate to the approximate centroid coordinates at 37.565703°, -120.627269°. Directions to the survey location from Sacramento, CA area as follows:

- Follow I-5 S and CA-99 S to E. Keyes Road in Keyes
- Take exit 218 from CA-99 S for Keyes Road
- Turn right onto Santa Fe Avenue
- Turn left onto E. Monte Vista Avenue
- Turn left onto Hickman Road
- Turn right onto E. Keyes Road
- Turn left onto Hawkins Road, the study area is on the right side

1.2 Contact Information

1.2.1 Applicant

Name: Chad Tienken
Title: Principal Engineer
Company/agency: Davids Engineering, Inc.
Address: 346 East F Street, Oakdale, CA 95361
Contact information: (530) 757-6107

1.2.2 Property Owner

Name: Several
Title:
Company/agency:
Address:
Contact information:

1.2.3 Agent

Name: Eastside Water District
Address: 731 East Yosemite Avenue, Suite B #147, Merced, CA, 95340
Contact information: Sarah Woolf 559-341-0174

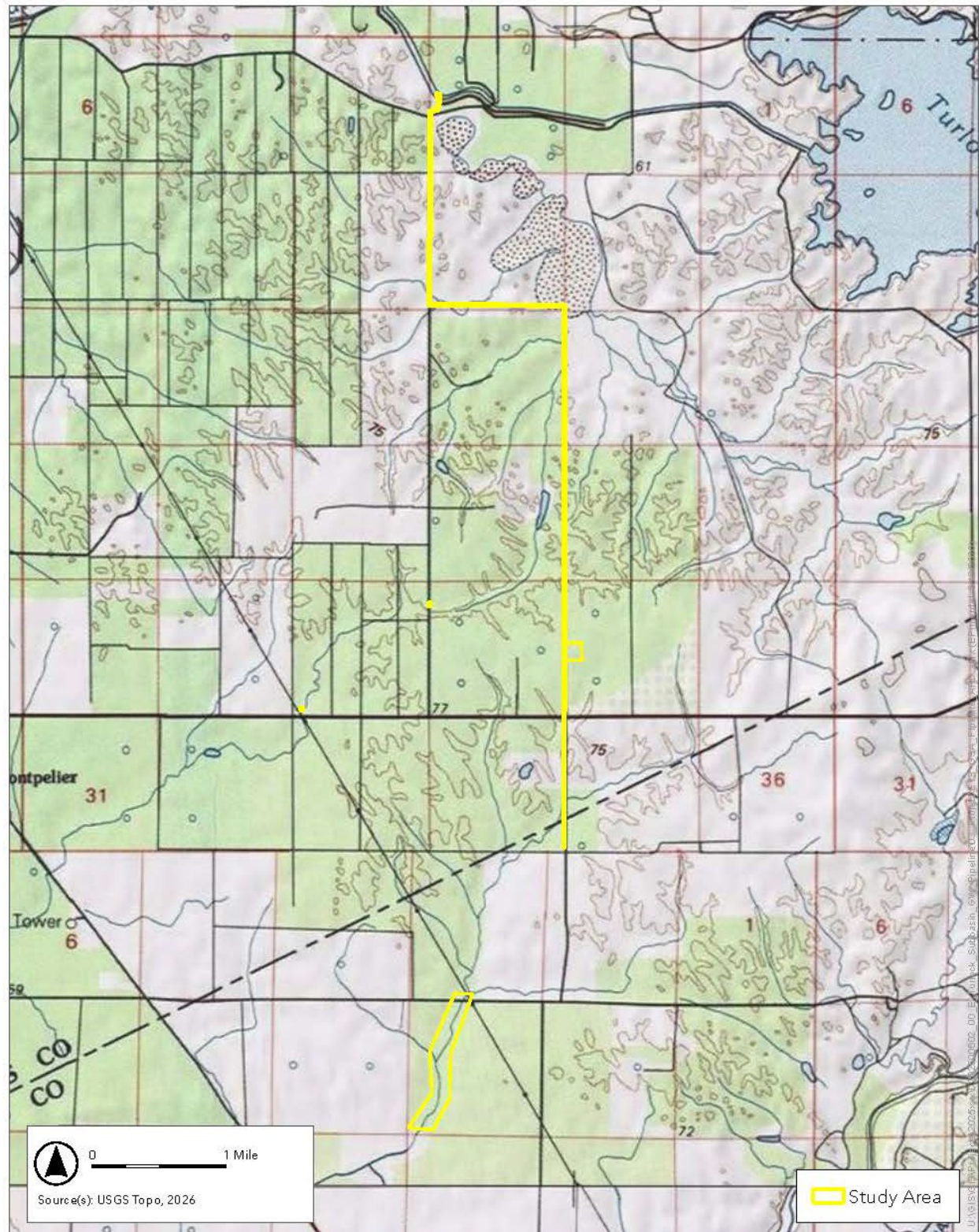


Figure 3
Topographic Map



1.2.4 Delineator(s)

Name: Angelica Oregel

Title: Ecologist

Company/agency: Environmental Science Associates

Address: 2600 Capitol Avenue Suite 200

Sacramento, CA 95816-5929

Contact information: aoregel@esassoc.com

Name: Missy Zepeda

Title: Associate Biologist

Company/agency: Environmental Science Associates

Address: 2600 Capitol Avenue Suite 200

Sacramento, CA 95816-5929

Contact information: mzepeda@esassoc.com

CHAPTER 2

Existing Conditions

2.1 Study Area

The study area is located in Stanislaus and Merced Counties (Figures 1 and 2). Regionally, the site is in the center of the Great Valley Ecological Section, which historically supported extensive prairies, oak savannas, desert grasslands, riparian woodlands, freshwater marshes, and vernal pools. More than one-half of the region has been converted to cropland, approximately three-fourths of which are irrigated (Miles and Goudey, 1997). The current ecological conditions of the study area would best be described as intensively managed agricultural orchards and fields. Irrigation water is supplied by groundwater.

The study area encompasses an approximately 34,900 proposed conveyance pipeline centered on local paved and dirt roads, with a 50-foot buffer on either side and a small portion of irrigated almond orchard. The study area also includes a section of Mustang Creek to be re-channelized; a small area within a fallowed field off of East Keyes Road proposed for a regulating basin; and two locations along Sand Creek that are proposed for culvert installation. These areas are surrounded on all sides by irrigated agricultural lands. A large aquatic feature (known as Rouse Lake) lies just beyond the northeastern study area boundary on adjacent property.

The study area was accessible by foot or vehicle and was walked during surveys, taking care to stay within the study area boundaries and within approved lands.

2.2 Vegetation Communities and Land Cover Types

Vegetation communities are assemblages of plant species that occur together in the same area, are repeated across landscapes, and are defined by species composition and relative abundance. Within the study area limits, the dominant land cover consists of paved and unpaved roadway surfaces. The 25-foot buffer on either side of the roadway corridor encompasses limited areas of orchard, fallow agricultural fields, and irrigation-related drainage ditches, all of which represent highly managed and disturbed vegetation types.

2.2.1 Ruderal Roadways

Along the dirt roadside, ruderal vegetation species observed included broad leaf filaree (*Erodium botrys*, FACU), chickweed (*Stellaria media*, UPL), and prickly lettuce (*Rumex crispus*, FAC). Due to frequent agricultural traffic, those areas remain sparsely vegetated.

2.3 Soils

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Study was consulted to determine the soil units occurring within the delineation study area. The Custom Soil Resource Report for Eastern Stanislaus Area and Merced Area, California (NRCS, 2026; included as Appendix A) shows 26 soil units occurring within the study area. Only one of them, Meikle clay, 0 to 1 percent slopes (MkA), is listed by the NRCS on the national hydric soils list for Eastern Stanislaus County, California (NRCS, 2026). A brief description of each soil unit is provided below. Please see Appendix A for a soils report showing the soil units in the study area, as well as a source for the descriptions in **Table 2-1**.

**TABLE 2-1
STUDY AREA SOILS**

Soil Series	Description	Percent of Study Area	Hydric Soil List? (Y/N)
Atwater loamy sand, 3 to 8 percent slopes (AfB)	Very deep, well-drained granitic alluvium soils with rapid permeability; supports orchards, vineyards, and irrigated; well-trained with very low runoff.	3.2%	N
Atwater loamy sand, deep over hardpan, 3 to 8 percent slopes (AgB)	Similar to AfB but with a deeper, cemented hardpan restricting rooting depth; moderately well drained	2.3%	N
Greenfield sandy loam, 0 to 3 percent slopes (GsA)	Deep, well-drained soils on alluvial fans; moderately coarse texture; parent material derived from igneous, metamorphic and sedimentary rock; Prime farmland if irrigated	3.0%	N
Greenfield sandy loam, deep over hardpan, 0 to 3 percent slopes (GvA)	Same parent material as GsA but with a buried hardpan; limits deep rooting and water storage; well drained with very low runoff.	7.7%	N
Hanford sandy loam, 0 to 3 percent slopes (HdA)	Very deep, well-drained soils on floodplains and fans; Prime farmland if irrigated	1.8%	N
Meikle clay, 0 to 1 percent slopes (MkA)	Nearly level, heavy clay soils with slow permeability; seasonally ponded; Prime farmland if irrigated.	1.5%	Y
Montpellier coarse sandy loam, 3 to 8 percent slopes (MtB)	Moderately deep, well-drained soil on old terraces; coarse texture; Prime farmland if irrigated. This series is non-saline to very slightly saline.	6.2%	N
Montpellier coarse sandy loam, 8 to 15 percent slopes, eroded (MtC2)	Same as MtB but with significant erosion; reduced topsoil depth and productivity.	1.6%	N
Pentz loam, moderately deep, 8 to 15 percent slopes (PmC2)	Moderately deep soils over hardpan on foothills; well drained but droughty; used mainly for rangeland, not prime farmland	7.3%	N
Rocklin sandy loam, 0 to 3 percent slopes (RkA)	Moderately deep soils over hardpan; well drained but with limited rooting depth; used for irrigated crops where hardpan is fractured.	1.0%	N
Rocklin sandy loam, 3 to 8 percent slopes, eroded (RkB)	Similar to RkA but with erosion reducing topsoil thickness; well drained with high runoff.	5.3%	N
Rocklin sandy loam, 8 to 15 percent slopes, eroded (RkC2)	Steeper, more eroded version; mainly rangeland; well drained with high runoff.	0.6%	N
San Joaquin sandy loams, 3 to 8 percent slopes (SaB)	California's state soil; moderately deep with a dense, cemented hardpan; moderately well drained; used for orchards with deep ripping, not prime farmland	4.2%	N

Soil Series	Description	Percent of Study Area	Hydric Soil List? (Y/N)
San Joaquin sandy loam, 0 to 3 percent slopes (ScA)	Near level version; same hardpan limitations; common in irrigated agriculture, moderately well drained with high runoff.	1.7%	N
San Joaquin sandy loam, 3 to 8 percent slopes (ScB)	Slight sloping; similar limitations; erosion risk increases with slope; moderately well drained with high runoff.	3.9%	N
Snelling sandy loam, 0 to 3 percent slopes (SnA)	Deep, well-drained soil on terraces; good for orchards and irrigated crops and well drained with medium runoff.	1.8%	N
Snelling sandy loam, 3 to 8 percent slopes (SnB)	Same as SnA but on gentle slopes; slight erosion hazard and well drained with high runoff. Prime farmland if irrigated.	2.7%	N
Tujunga loamy sand, 0 to 3 percent slopes (TuA)	Very deep, excessively drained soils on alluvial fans; low water-holding capacity; Prime farmland if irrigated.	1.4%	N
Tujunga sand, 0 to 3 percent slopes (TvA)	Even sandier and more droughty than TuA; requires intensive irrigation management, farmland of statewide importance.	0.4%	N
Whitney fine sandy loam, 3 to 8 percent slopes (WhB)	Moderately deep soils over hardpan; well drained but droughty; supports rangeland and some dryland crops; well-drained with medium runoff.	0.6%	N
Whitney and Rocklin soils, 3 to 8 percent slopes, eroded (WmB2)	Complex of two hardpan soils; erosion reduces productivity; mainly rangeland.	13.8%	N
Whitney sandy loams, 8 to 15 percent slopes, eroded (WmC2)	Steeper, eroded version; shallow rooting; used for grazing and well- drained with medium runoff.	9.6%	N
Whitney sandy loams, 15 to 30 percent slopes, eroded (WmD2)	Steep foothill soils; droughty and shallow; rangeland only and well- drained with high runoff. Not prime farmland.	12.7%	N
Whitney and Rocklin sandy loams, 3 to 8 percent slopes (WrB)	Hardpan soils with moderate slopes; limited rooting depth; used for rangeland or limited agriculture; well drained with medium runoff. Not prime farmland.	3.4%	N
Whitney and Rocklin sandy loams, 8 to 15 percent slopes (WrC)	Steeper version; erosion hazard; primarily rangeland and well-drained with medium runoff.	1.9%	N

2.4 Hydrology

The study area lies within the eastern portion of the Turlock Subbasin and Middle San Joaquin-Lower Merced- Lower Stanislaus Watershed which is part of the larger San Joaquin River Watershed. This watershed drains an extensive region of agricultural lands and managed water infrastructure, both of which influence surface-water flows, groundwater recharge, and regional water quality. Runoff from the Sierra Nevada feeds the major rivers in the system, transporting water through a highly cultivated and hydrologically modified landscape. The study area itself is surrounded by intensively farmed land and shaped by a combination of natural hydrologic features and engineered water-delivery systems. Key hydrologic influences include the Tuolumne River, Turlock Lake, and the Merced River.

The Tuolumne River, a major tributary of the San Joaquin River, provides regulated flows that support agricultural and municipal demands, while Turlock Lake, operated by the TID, serves as a flood control facility. In addition to these major features, the area is interlaced with man-made and natural drainage channels that provide stormwater conveyance during the rain season. Previously natural streams and channels, including Mustang Creek, have been artificially configured to convey surficial runoff. These

channels, along with shallow swales formed by land grading and runoff patterns, contribute to localized surface drainage and seasonal hydrologic connectivity. While these features may exhibit flow during storm events, they are typically dry outside of peak water use periods.

Groundwater–surface water interactions within this watershed are essential in sustaining agricultural productivity and ecological resources. Irrigation diversions, recharge basins, and canal networks strongly influence the timing, distribution, and movement of water across the basin. Consequently, the watershed is a focal point for groundwater sustainability planning, habitat management, and coordinated water operations among regional agencies. Its hydrologic dynamics play a central role in the long-term resilience of water resources in the subbasin.

2.5 Climate

The regional vicinity is described as having a dry climate characterized by hot summers and mild, foggy winters with the bulk of precipitation occurring as rain in the winter months. Average highs for the region range between 57 degrees Fahrenheit (°F) in the winter (December and January) and 90°F in the summer (July and August), while average lows range between 43°F in the winter and 64°F in the summer (NOAA 2026).

2.5.1 Antecedent Precipitation Tool

The Antecedent Precipitation Tool (APT; Version 2.0.0) (USACE 2026) was also used to evaluate climatic conditions at the project site. The APT Watershed Sampling Summary provided in **Appendix B, Climatological Data**, summarizes precipitation and climatic data for the project site for the three months before the delineation survey date of December 01, 2025. These data show the project site exhibited precipitation and climate within the wetter than normal range of conditions. The Antecedent Precipitation Score (derived from the Antecedent Condition Calculation of the 3 prior months) of 18 indicates that climatic conditions were wetter along with the corresponding Palmer drought severity index suggests mild wetness (see **Table 2-2**). Rainfall in the 30-day periods ending on December 1, 2025, received higher than normal precipitation amounts for each respective month according to the APT results (Appendix B).

TABLE 2-2
ANTECEDENT PRECIPITATION TOOL RESULTS FOR THE PROJECT SITE ON DECEMBER 1, 2025

No. of Sampling Points	PDSI Class	Season	Antecedent Precipitation Score	Antecedent Precipitation Condition
1	Mild Wetness	Wet Season	18	Wetter than Normal
2	Mild Drought	Dry Season	10	Normal Conditions

Note: PDSI = Drought index
Source: USACE 2026.

CHAPTER 3

Regulatory Framework

3.1 Waters of the United States

3.1.1 Clean Water Act

The CWA establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but the law was significantly reorganized and expanded in 1972. “Clean Water Act” became the law’s common name with amendments in 1972.

Section 404 of the CWA establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and mining projects. Section 404 requires that a permit be issued before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from regulation under Section 404 (e.g., certain farming and forestry activities).

“Wetlands” are defined by USACE as “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” (33 CFR 328.3[c][1]; 40 CFR 120.2[c][1]). Indicators of three wetland parameters (hydric soils, hydrophytic vegetation, and wetlands hydrology), as determined by site investigation, must be present at a site for USACE to classify the site as a wetland (Environmental Laboratory 1987).

Section 401 of the CWA gives the state authority to grant, deny, or waive certification of proposed federally licensed or permitted activities resulting in discharge to waters of the United States. The State Water Resources Control Board (State Water Board) directly regulates multi-regional projects and supports the Section 401 certification and wetlands program statewide. The regional water quality control board (RWQCB) regulates activities pursuant to Section 401(a)(1) of the federal CWA, which specifies that certification from the state is required for any applicant requesting a federal license or permit to conduct any activity including but not limited to the construction or operation of facilities that may result in any discharge into navigable waters. The certification shall originate from the state or appropriate interstate water pollution control agency where the discharge originates or will originate. Any such discharge will comply with the applicable provisions of CWA Sections 301, 302, 303, 306, and 307.

3.1.2 Waters of the United States

Since its inception, the definition of “waters of the United States” has been a litigious issue. Most recently, the Supreme Court, ruling in *Sackett v. Environmental Protection Agency*, sharply limited the scope of the federal CWA’s protection for the nation’s waters. As a result of this decision, EPA and USACE issued a final rule that amends the “Revised Definition of ‘Waters of the United States’” to conform key aspects of the regulatory text to the U.S. Supreme Court’s decision (88 *Federal Register* 61964–61969, September 8, 2023).

Under the “Revised Definition of ‘Waters of the United States’; Conforming” rule, the term “waters of the United States” is defined as follows (33 CFR 328.3[a]):

- (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.

In addition, the amended regulations include eight types of excluded waters (33 CFR 328.3[b]) that 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.

3.2 Waters of the State

Most projects involving water bodies or drainages are regulated by the RWQCB, the principal state agency overseeing waters of the state, including water quality, at the regional and local levels. The study area is located within the region of the Central Valley RWQCB. RWQCBs regulate waters of the state under both federal and state regulations. RWQCBs are responsible for implementing Section 401 of the CWA as described above in Section 3.1.1, *Clean Water Act*. RWQCBs also regulate waters of the state pursuant to the Porter-Cologne Water Quality Control Act (Porter-Cologne Act), as described in more detail below.

3.2.1 Porter-Cologne Water Quality Control Act of 1969

The Porter-Cologne Act was adopted in 1969 and is in the California Water Code, specifically Section 1300 et seq. The Porter-Cologne Act specifies that rights and water quality protection responsibilities fall to the State Water Board and directs the nine RWQCBs to plan and enforce water quality standards of the state. Regional water quality control plans (i.e., basin plans) were prepared and adopted in accordance with the Porter-Cologne Act. The Porter-Cologne Act defines “waters of the state” as “any surface water or groundwater, including saline waters, within the boundaries of the State.” All waters of the United States are also waters of the state, but not all waters of the state are waters of the United States. The jurisdictional extent of waters of the state encompasses and surpasses the jurisdictional extent of waters of the United States. The RWQCBs regulate waters of the state via Individual and General Waste Discharge Requirements (WDRs) pursuant to the Porter-Cologne Act.

When issuing a 401 certification, the RWQCB simultaneously issues WDRs under Order 2004-0004, which are General WDRs that were adopted for projects that also require a 401 certification. In the absence of a federal nexus to issue a 401 certification, waters of the state are still regulated under the Porter-Cologne Act if project activities, discharges, or proposed activities or discharges could affect California's surface, coastal, or ground waters.

The *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (State Wetland Definition and Procedures), as prepared by the State Water Board, was adopted April 2, 2019, and revised April 6, 2021. The State Wetland Definition and Procedures include a definition for wetland waters of the state and exclusions for certain artificial wetlands.

The State Water Board defines an area as wetland as follows:

An area is 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.

The following wetlands are waters of the state (unless the exclusion criteria in Parts d.i through d.xii are met):

1. Natural wetlands.
2. Wetlands created by modification of a surface water of the state.
3. Artificial wetlands that meet any of the following criteria:
 - a. Approved by an agency as compensatory mitigation for impacts to other waters of the state, except where the approving agency explicitly identifies the mitigation as being of limited duration.
 - b. Specifically identified in a water quality control plan as a wetland or other water of the state.
 - c. Resulted from historic human activity, is not subject to ongoing operation and maintenance, and has become a relatively permanent part of the natural landscape.
 - d. Greater than or equal to one acre in size, unless the artificial wetland was constructed, and is currently used and maintained, primarily for one or more of the following purposes (i.e., the following artificial wetlands are not waters of the state unless they also satisfy the criteria set forth in 2, 3a, or 3b):
 - i. Industrial or municipal wastewater treatment or disposal.
 - ii. Settling of sediment.
 - iii. Detention, retention, infiltration, or treatment of stormwater runoff and other pollutants or runoff subject to regulation under a municipal, construction, or industrial stormwater permitting program.
 - iv. Treatment of surface waters.

- v. Agricultural crop irrigation or stock watering.
- vi. Fire suppression.
- vii. Industrial processing or cooling.
- viii. Active surface mining—even if the site is managed for interim wetlands functions and values.
- ix. Log storage.
- x. Treatment, storage, or distribution of recycled water.
- xi. Maximizing groundwater recharge (this does not include wetlands that have incidental groundwater recharge benefits).
- xii. Fields flooded for rice growing.

3.3 Rivers, Streams, and Lakes

Pursuant to Division 2, Chapter 6, Section 1600 et seq. of the California Fish and Game Code, CDFW regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake which supports fish or wildlife. A notification of a lake or streambed alteration must be submitted to CDFW for “any activity that may substantially change the bed, channel, or bank of any river, stream, or lake.” In addition, CDFW has authority under the Fish and Game Code over wetland and riparian habitats associated with lakes and streams. CDFW reviews proposed actions and, if necessary, submits to the applicant a proposal that includes measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by CDFW and the applicant is the Lake and Streambed Alteration Agreement.

Fish and Game Code Section 2785 defines “riparian habitat” as “lands which contain habitat which grows close to and depends upon soil moisture from a nearby freshwater source.” Additionally, the CDFW Notification Instructions and Process guide characterizes the riparian zone as “the area that surrounds a channel or lake and supports (or can support) vegetation that is dependent on surface or subsurface flow.” Furthermore, this CDFW guide calls for the analysis of impacts on the riparian zone up to the outer landward edge of the drip line of riparian vegetation.

This page intentionally left blank

CHAPTER 4

Methodology

4.1 Pre-survey Review

Prior to conducting the aquatic resources delineation, ESA conducted a review of available background information pertaining to the study area. The following resources were reviewed:

- U.S. Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2025).
- USGS 7.5-minute topographic quadrangle map: Montpelier (USGS 2025).
- Current aerial imagery (Google Earth).
- Precipitation data from the Applied Climate Information System (NOAA 2025).
- The NWI (USFWS 2025).
- The NHD (USGS 2025).

The result of the NWI database query is provided in **Figure 4**.

4.2 Survey Methods

A delineation of aquatic resources within the study area was conducted on December 02, 2025, by ESA biologists Angelica Oregel and Missy Zepeda. An additional delineation was conducted on May 04, 2026, by ESA biologists AJ Samra and Ariana Catanuso following the addition of new project locations within the study area. Survey data were collected using an EOS Arrow 100 Global Navigation Satellite System receiver, which provides Satellite-based Augmentation System corrections processing during the survey and can provide sub-meter real-time horizontal accuracy.

The delineation was conducted by walking or driving through the study area to areas where potential jurisdictional features were identified during the review of existing data and aerial imagery. Features that were identified as potentially jurisdictional included, but were not limited to, drainages that had an OHWM and defined channels with bed and bank, as well as potential wetlands evidenced by visible hydrologic indicators and/or hydrophytic vegetation. Additional data, such as landforms, vegetation, hydrology, and soils, were noted where these characteristics were pertinent to identification of features.

Potential jurisdictional features were identified and delineated following current federal and state methodology and guidelines, including waters of the United States, waters of the state, and California Fish and Game Code Section 1600 resources. Survey data forms are included in **Appendix C, Data Sheets**.

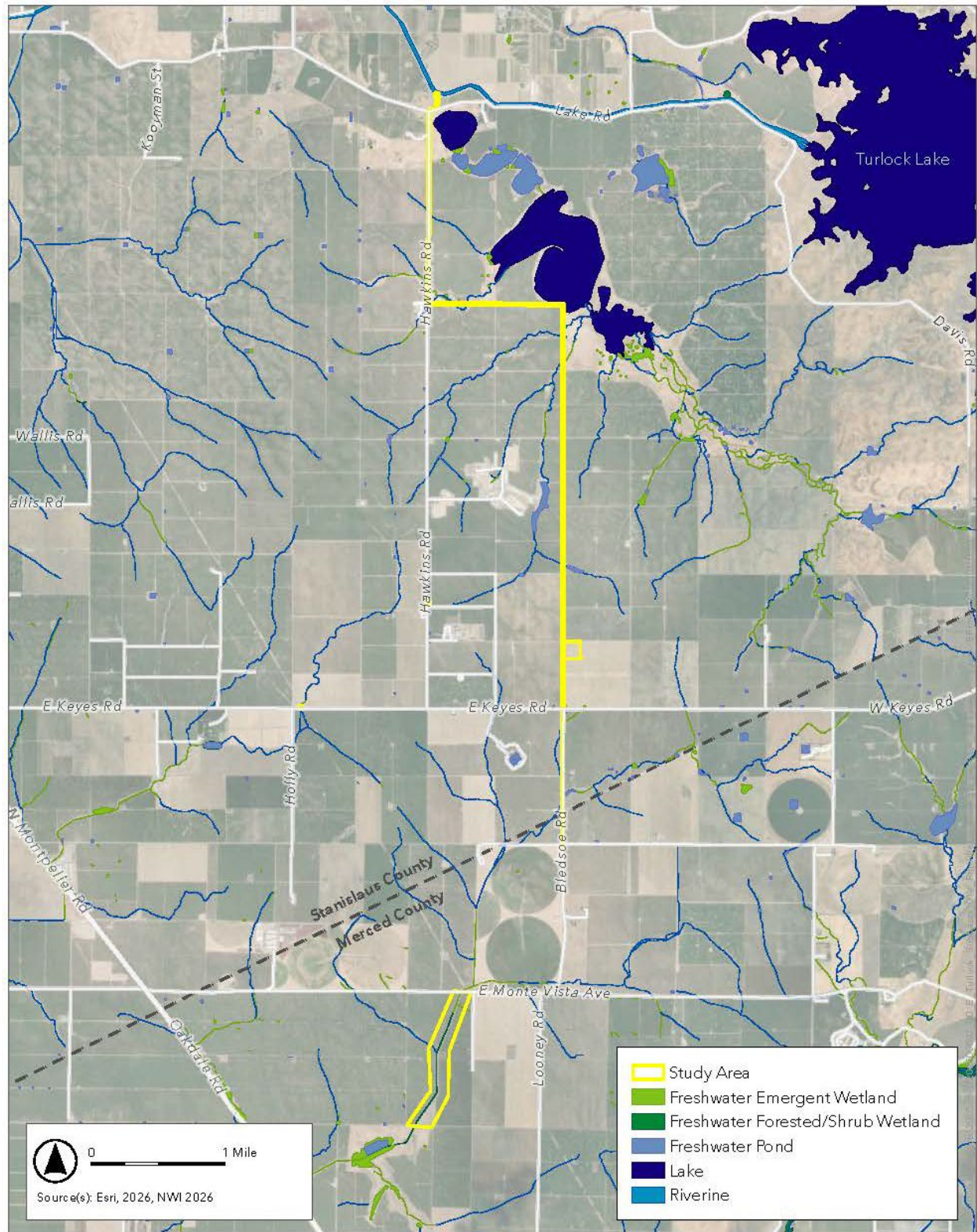


Figure 4
National Wetlands Inventory



4.2.1 Waters of the United States

Wetlands

The delineation used the “Routine Determination Method” as described in the *1987 Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987), hereafter called the “1987 Manual.” The 1987 Manual was used in conjunction with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE 2008a), hereafter called the “Arid West Supplement.” For areas where the 1987 Manual and the Arid West Supplement differ, the Arid West Supplement was followed. Wetlands and waters were classified using commonly accepted habitat types; however, the Cowardin classification (Cowardin et al. 1979) of each feature type is noted in the discussion in Chapter 5.

To determine the extent of potential jurisdictional wetlands on a project site, the 1987 Manual and Arid West Supplement were used as a guide for identifying wetland characteristics. Three positive wetland parameters must normally be present for an area to be considered a wetland: (1) a dominance of wetland vegetation, (2) presence of hydric soils, and (3) presence of wetland hydrology. Presence or absence of positive indicators for wetland vegetation, soils, and hydrology was assessed per the 1987 Manual and Arid West Supplement guidelines. Data points were taken within suspected wetlands, and a paired point was taken (where applicable) in nearby upland areas. Data points were recorded on Arid West Region wetland determination data forms, which are provided in Appendix C.

At each data point, a visual assessment of the dominant plant species within the vegetation community was made. Dominant species were assessed using the recommended “50/20” rule per the Arid West Supplement. Plants were identified to species using the *The Jepson Manual: Vascular Plants of California, Second Edition* (Baldwin et al. 2012). The *Arid West 2022 Regional Wetland Plant List* (USACE 2022) was used to determine the wetland indicator status of all plants.

Hydric soils were identified using soil indicators presented in the Arid West Supplement and the *Field Indicators of Hydric Soils in the United States*, Version 8.2 (NRCS 2018). Soils at each data point were characterized by color, texture, organic matter accumulation, and the presence or absence of hydric soil indicators. The coloration of the soil samples, matrix, and mottles is assessed using the *Munsell Soil Color Book* (Munsell 2000).

The presence of wetland hydrology was determined at each data point by the presence of one of the primary indicators or two secondary indicators, per the guidance of the Arid West Supplement.

Non-wetland (Other) Waters of the United States

Non-wetland waters of the United States extend to the OHWM, defined in 33 CFR 328.3 as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, or the presence of litter and debris. In the Arid West region of the United States, waters are variable and include ephemeral, intermittent, and perennial channel forms. The most problematic ordinary high-water delineations are associated with the commonly occurring ephemeral and intermittent channel forms that dominate the Arid West landscape.

Delineation methods were completed in accordance with the *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams (Final Version)* (USACE 2025) and the *Rapid Ordinary High Water Mark (OHWM) Field Identification Data Sheet* (ENG Form 6250). OHWM data sheets are provided in Appendix C.

Methodology for Applying the Relatively Permanent Standard

The Relatively Permanent Standard (RPS) was applied to determine whether an aquatic resource qualifies as a water of the United States as any of the following:

- **(a)(3) Tributaries** of (a)(1) or (2) waters.
- **(a)(4) Wetlands** adjacent to an RPW (Relatively permanent, standing or continuously flowing bodies of water identified as an as [a][2] or [a][3] water and with a continuous surface connection to those waters).
- **(a)(5) Intrastate lakes and ponds** not identified in paragraphs (a)(1) through (a)(4).

An evaluation of the applicability of the RPS was conducted for:

Wetlands: Under the RPS for (a)(4) adjacent wetlands, such wetlands must be adjacent to an RPW identified as an (a)(2) or (a)(3) water and must meet the continuous surface connection requirement (CSC). A wetland ecologist also evaluated whether a CSC was present, based on whether:

- The wetland(s) physically abut, or touch, either an [a][1] water, a relatively permanent impoundment of waters ([a][2] water) or a jurisdictional tributary ([a][3] water) that also meets the RPS, OR
- The wetland(s) connects to an impoundment or tributary ([a][2] or [a][3] waters) by a discrete feature like a non-jurisdictional ditch, swale, pipe, or culvert.

Perennial or intermittent streams: Under the RPS for (a)(3) tributaries or (a)(5) lakes and ponds, such aquatic resources must exhibit sufficient flow during certain times of the year. The phrase “certain times of the year” includes extended periods of standing or continuously flowing water occurring in the same geographic feature year after year, except in times of drought. To determine whether the RPS applies, the flow characteristics of each stream were evaluated along the entire reach of the same Strahler stream order (Strahler 1957) (i.e., from the point of confluence, where two lower order streams meet to form the tributary, downstream to the point such tributary enters a higher order stream).

4.2.2 Waters of the State

Waters of the state outside of CWA Section 401 jurisdiction and subject to the Porter-Cologne Water Quality Control Act and the State Wetland Definition and Procedures (State Water Board 2021) were delineated to also include aquatic features up to the top of bank per the delineation guidance provided by the Central Valley RWQCB.

4.2.3 Rivers, Streams, and Lakes

California Fish and Game Code Section 1600 resources were delineated to include bed, bank, and channel up to the top of bank, and/or associated wetlands and riparian vegetation to the outer drip line, whichever is wider.

This page intentionally left blank

CHAPTER 5

Results

5.1 Aquatic Resources

All mapped aquatic features within the study area were evaluated through field verification and desktop review to determine whether each may be considered jurisdictional. A total of 2.04-acre (approximately 6,000 linear feet) of irrigation canal, playa pool, pond and drainage features and 0.38-acre wetlands were identified within the study area and are described in detail below. Wetland determination results are provided in Appendix C, *Data Sheets*; representative photographs are provided in **Appendix D, Representative Photographs**. The Aquatic Resources Spreadsheet is provided in **Appendix E**.

5.2 Waters of the United States

As defined under Section 3.1, under the Revised Definition of Waters of the United States, there are five categories that are considered jurisdictional waters of the United States:

- (a)(1) territorial seas and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide, and interstate waters, including interstate wetlands
- (a)(2) impoundments of waters of the United States
- (a)(3) tributaries of waters of the United States that meet the RPS
- (a)(4) wetlands adjacent to certain waters that meet the RPS
- (a)(5) intrastate lakes and ponds that meet the RPS

Aquatic resources within the study area are illustrated in **Appendix F**, presented at the end of this chapter. Evaluation of the aquatic resources within the study area to determine whether they meet the Revised Definition of Waters of the United States is presented in **Table 5-1**. The mapped aquatic features, except the TID Main Canal, were determined not to meet Revised Definition of Waters of the United States.

TABLE 5-1
POTENTIAL WATERS OF THE UNITED STATES

Aquatic Resource ID	Cowardin Type	Waters of the United States		Non-jurisdictional		Rationale *
		ac	Linear feet	ac	Linear feet	
Wetlands						
FEW-1	PEM t	--	--	0.03	--	The wetlands are not adjacent to a RPW identified as an (a)(2) or (a)(3) water.
FEW-2	PEM	--	--	0.04	--	
FEW-3	PEM	--	--	0.07	--	
FEW-4	PEM	--	--	0.09	--	
FEW-5	PEM	--	--	0.10	--	
FEW-6	PEM	--	--	0.05	--	
Other Waters						
C-1	R4SB	0.103	100		--	(a)(3)
IC-1	R6	0.566	5335	--	--	(a)(3)
IC-2	R6	0.012	137	--	--	(a)(3)
ED-1	R6	--	--	0.001	9	Ephemeral channel around the agricultural areas and does not meet the RPS.
ED-2	R6	--	--	0.01	38	
ED-3	R6	--	--	0.02	34	
ED-4	R6	--	--	0.07	334	
ED-5	R6	--	--	0.002	20	
ED-6	R6	--	--	0.02	39	
ED-7	R6	--	--	0.004	51	
P-1	R6	--	--	0.04	--	(b)(5)
P-2	R6	--	--	1.492	--	(b)(5)
PP-1	PUB	--		0.08	--	Playa pool that does not have continuous surface connection with an RPW
Total of Jurisdictional Waters of U.S.				0.681	5572	
Total of Non-Jurisdictional Other Waters				1.739	525	

Notes: PEM=Palustrine, Emergent; R4SB= Streambed, Intermittent, Riverine; R6=Riverine, Ephemeral; PUB: Unconsolidated Bottom, Palustrine.

* See Section 3.1.2 for complete definition of jurisdictional waters.

5.2.1 Potential Other Waters of the United States

Canal

The mapped canal includes a short segment of the TID Main Canal (C-1). The TID Main Canal is a primary water conveyance facility within TID's service area, delivering surface water diverted from the Tuolumne River to agricultural lands throughout the region. The canal supports regional agricultural operations and contributes to groundwater recharge in certain reaches. Within the study area, the canal segment is concrete-lined and contained flowing water at the time of the field assessment.

Based on hydrologic permanence and substrate characteristics, the mapped canal can be classified as Riverine, Intermittent, Consolidated Bottom according to the Cowardin Classification System (FGDC,

2013). The canal is connected to the San Joaquin River, which is a Navigable Waterbody of U.S., therefore, the mapped streams would likely be considered a Water of the United States under (a)(3).

Intermittent Channel (Mustang Creek)

Mapped features IC-1 and IC-2 are sections of Mustang Creek, a named intermittent stream surrounded by agricultural fields. Mustang Creek is an artificially altered channel that operates in conjunction with existing hydrologic infrastructure to carry surficial runoff from the surrounding region. No flowing surface water was observed during the survey. Within the study area, this stream exhibits a natural bed and bank. OHWM was indicated by a change in vegetation cover and density from within the channel to the top of bank.

Mustang Creek can be classified as Riverine, Intermittent, Unconsolidated Bottom based on the Cowardin Classification System (FGDC, 2013). Mustang Creek is hydrologically connected to the TID High Line Canal, which is connected with the Merced River. As the Merced River is a Navigable Waterbody of the U.S., therefore Mustang Creek would be considered a potential Water of the United States under (a)(3).

5.2.2 Potential Non-jurisdictional Features

The Revised Definition of Waters of the United States specifically identifies eight types of excluded waters that are considered non-jurisdictional. Specifically, the Revised Definition of Waters of the United States excludes the following waters: (b)(1) wastewater treatment systems; (b)(2) prior converted cropland designated by the Secretary of Agriculture; (b)(3) ditches (including roadside ditches) excavated wholly in and draining only dry land; (b)(4) artificially irrigated areas that would revert to dry land if the irrigation ceased; (b)(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; (b)(6) artificial reflecting or swimming pools or other small ornamental bodies of waters; (b)(7) waterfilled depression created in dry land incidental to construction activity; and (b)(8) swales and erosional features. Based on the results of the aquatic resource delineation, non-jurisdictional wetlands/other features were identified in the study area.

Furthermore, those features that do not meet the RPS or otherwise do not meet definitions of one of the (a)(1) through (a)(5) waters categories may also be considered non-jurisdictional.

Non-jurisdictional (Other) Features

Fresh Emergent Wetlands

These emergent wetlands identified in the study area (FEW-1 through FEW-6) occur along the drainages that pond water or remain saturated for extended periods during a portion of the year, often throughout the wet season, then dry up in spring or early summer.

Dominant plant species include narrow leaf cattail (*Typha angustifolia*, OBL¹), tapertip flatsedge (*Cyperus acuminatus*, OBL), coyote willow (*Salix exigua*, FACW) and poison hemlock (*Conium maculatum*, FACW). Surface water was present in the study area at the time of the survey (Photo 2,

¹ FAC = facultative (occurs in wetlands and non-wetlands); FACW = facultative wetland (usually occurs in wetlands but may occur in non-wetlands); OBL = obligate wetland (almost always occurs in wetlands under natural conditions); NL = not listed.

Appendix D). Wetland hydrology included Surface Water (A1), Saturation (A3). Wetland hydric soil indicators included Redox Dark Surface (F6). Sample point 1 reflects the conditions observed in the emergent wetlands during the field investigation and the surrounding upland areas are represented by sample point 2. Mapped features FEW-5 and FEW-6 were not accessible for data collection due to fencing (Photo 15, Appendix D).

The emergent wetlands within the study area are classified as Palustrine Emergent Wetland (Seasonally Flooded) using the *Classification of Wetlands and Deepwater Habitats of the United States* (FGDC, 2013). The FEW-1 to FEW-6 are not adjacent to a RPW identified as an (a)(2) or (a)(3) water, therefore are potentially non-jurisdictional wetland Waters of United States.

Ephemeral Streams

The identified ephemeral ditches (ED-1 through ED-7) are small and shallow ditches in the agriculture field within the study area. The ditches were characterized as exhibiting ephemeral hydrology based on field observations and analysis of historical aerial imagery, indicating that surface flow is primarily driven by agricultural runoff and storm events. Water was not consistently present at all mapped ephemeral ditches (Photos 17, 18, 19, Appendix D). Therefore, ephemeral stream ED-1 through ED-7 do not meet the criteria of RPS and are not considered a potential tributary under paragraph (a)(3), as indicated in Table 5-1.

Playa Pool

The mapped playa pool (PP-1) represents a small portion of a larger playa feature located on the east side of the study area. This playa pool collects stormwater and agricultural runoff. During the survey, the pool was dry except for water present at the culvert outlet, and cattle were observed grazing in the area (Photo 16, Appendix D). PP-1 does not meet the criteria of the RPS and is considered potentially non-jurisdictional.

Pond

The mapped pond feature (P-1) is an isolated, small pond approximately 35 feet in diameter and 6 feet deep. It appears to be associated with agricultural pumping operations. Surface water was present at the time of the survey (Photo 13, Appendix D). P-1 is considered a potential non-jurisdictional Waters of the United States under (b)(4). The pond feature (P-2) was excavated within the agriculture field, and no surface water was present during the survey. P-2 is considered a potential non-jurisdictional Waters of the United States under (b)(5).

Sand Creek

Sand Creek was a historic intermittent drainage but was artificially altered, and the portion within the study area does not convey irrigation flows nor exhibit any features that characterize it as a state or federal jurisdictional water or wetland. Habitat is a combination of ruderal species and agriculture.

5.3 Waters of the State

The mapped fresh emergent wetland (FEW1 through FEW-6), the TID Main Canal (C-1), Mustang Creek (IC-1 and IC-2), ephemeral streams (ED-1 through ED-7), and playa pool (PP-1) within the study area would likely be considered waters of the State subject to regulation under the Porter-Cologne Act. The mapped isolated small pond feature (P-1) was likely excavated for agricultural pump operations and

appear to be regularly disturbed, therefore is not considered waters of the State. The other pond feature (P-2) was also excavated for agricultural purposes and is similarly not considered waters of the State.

5.4 Rivers, Streams, and Lakes

Areas potentially protected under Section 1600 et seq. of the California Fish and Game Code extend beyond the OHWM to the top of bank or outer extent of the riparian canopy (i.e., drip line). Potential CDFW resources include all waters of the state described above, as well as the riparian vegetation associated with the streams, except isolated pond feature P-1 and P-2.

5.5 Conclusions

Based on the results of the aquatic resources delineation and the jurisdictional analysis, it is presumed that 0.681-acre (5,572 linear feet) of potential other (non-wetland) waters of the United States and state occur within the study area. In addition, 0.38 acres of potential wetland waters of the state and additional 0.21 acres of potential other (non-wetland) waters of the state occur within the study area. Finally, it is presumed that 1.187 of stream and associated riparian habitat occurring within the study area are potentially protected under Section 1600 et seq. of the California Fish and Game Code.

This report documents the aquatic resources boundary delineation and best professional judgment of ESA investigators. All conclusions presented should be considered preliminary and subject to change pending official review and verification by the appropriate regulatory agencies.

This page intentionally left blank

CHAPTER 6

References Cited

- Baldwin, B.G., D. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D. Wilken (eds.). 2012. *The Jepson Manual: Vascular Plants of California, Second Edition*. Berkeley and Los Angeles: University of California Press.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. Washington, DC: U.S. Fish and Wildlife Service.
- Environmental Laboratory. 1987. *Corps of Engineers Wetland Delineation Manual*. Final Report. Wetlands Research Program Technical Report Y-87-1. Vicksburg, MS: U.S. Army Corps of Engineers, Waterways Experiment Station. January 1987.
- Mazor, R. James, A., Fritz, K.M., Topping, B., Nadeau, T.-L., Fertik Edgerton, R., and Nicholas, K. 2024. Streamflow Duration Assessment Methods for the Arid West and Western Mountains of the United States. Version 2.0. Document No. EPA-843-B-24002. Munsell. 2000. *Munsell Soil Color Book*. New Windsor, NY: GretagMacbeth.
- NRCS (U.S. Natural Resources Conservation Service). 2018. *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils*, Version 8.2. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.
- NRCS (U.S. Natural Resources Conservation Service). 2026. State Soil Data Access (SDA) Hydric Soils List. Available: <https://www.nrcs.usda.gov/publications/query-by-state.html>. Accessed January 2026.
- NRCS (U.S. Natural Resources Conservation Service). 2026. Web Soil Survey. Available: <http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>. Accessed January 2026.
- State Water Board (State Water Resources Control Board). 2021. *State Policy for Water Quality Control: State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*. Adopted April 2, 2019, and revised April 6, 2021.
- Strahler, A.N. 1957. Quantitative Analysis of Watershed Geomorphology. *American Geophysical Union Transactions* 38: 913–920.
- USACE (U.S. Army Corps of Engineers). 2008a. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*. Final Report. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center. September 2008.
- USACE. 2025b. Recommended Minimum Standards for Acceptance of Aquatic Resources Delineation Reports. Available: <https://usace.contentdm.oclc.org/utls/getfile/collection/p16021coll9/id/3136>.
- USACE. 2025c. Recording Aquatic Resource Delineations Using Global Navigation Satellite Systems. Available: <https://usace.contentdm.oclc.org/utls/getfile/collection/p16021coll9/id/3135>.

- USACE (U.S. Army Corps of Engineers). 2026. Antecedent Precipitation Tool, version 2.0.0. Available: <https://www.epa.gov/wotus/antecedent-precipitation-tool-apt>. Accessed January 2026.
- USACE. 2022. National Wetland Plant List (including 2020 regional plant lists). Available: https://wetland-plants.usace.army.mil/nwpl_static/v34/home/home.html. Accessed January 2026.
- USFWS (U.S. Fish and Wildlife Service). 2026. National Wetlands Inventory. Available: <https://www.fws.gov/wetlands/data/Mapper.html>. Accessed January 2026.
- USGS (U.S. Geological Survey). 2026. Montpelier USGS 7.5-Minute Quadrangle topographic map. Scale: 1:24,000.
- WorldClimate.com. 2026. Average Weather Data for Turlock, California. Available: <http://www.worldclimate.com/climate/us/california/turlock>. Accessed January 2026.

Appendix A

Soils Report



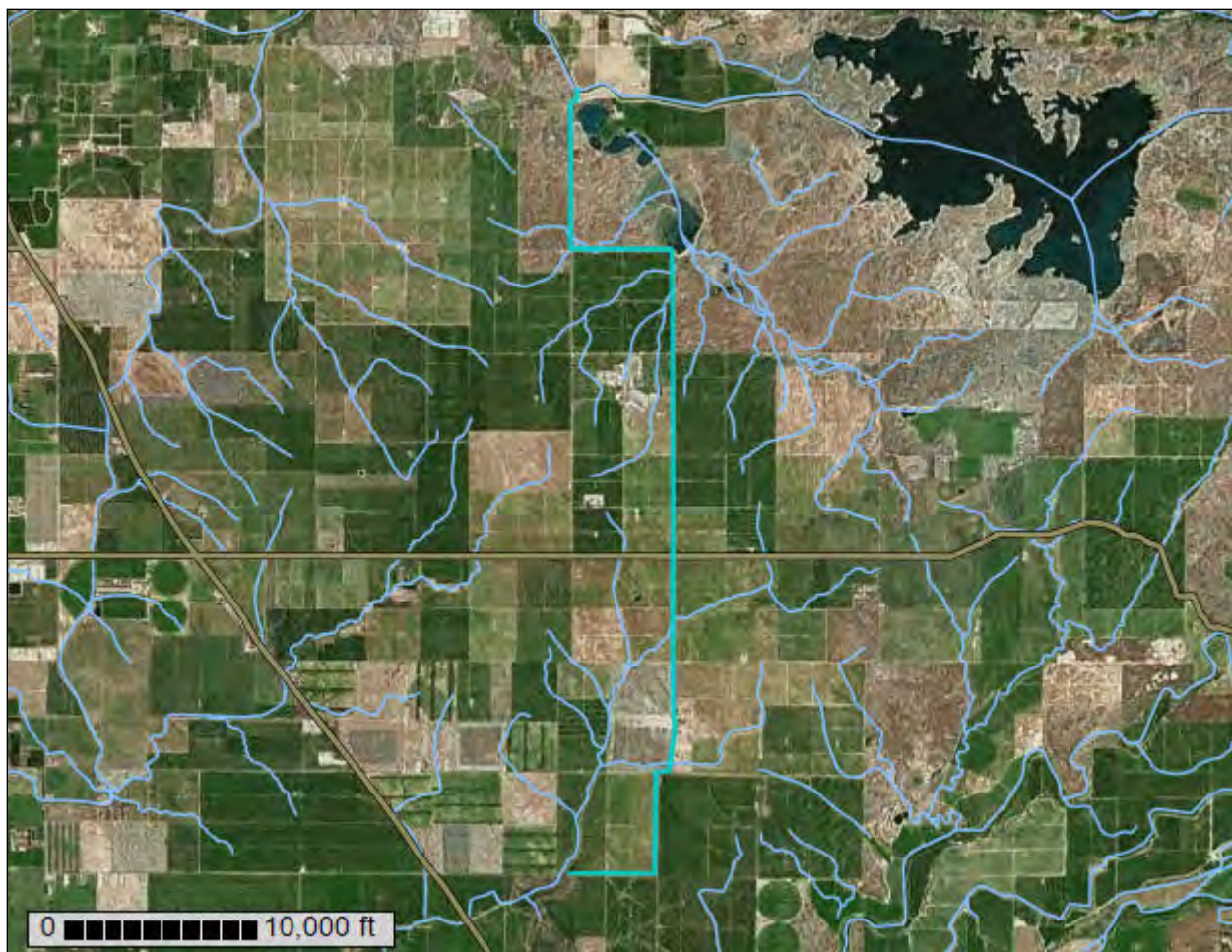
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Eastern Stanislaus Area, California, and Merced Area, California



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	8
Soil Map.....	9
Legend.....	10
Map Unit Legend.....	12
Map Unit Descriptions.....	13
Eastern Stanislaus Area, California.....	15
GsA—Greenfield sandy loam, 0 to 3 percent slopes.....	15
GvA—Greenfield sandy loam, deep over hardpan, 0 to 3 percent slopes..	16
HdA—Hanford sandy loam, 0 to 3 percent slopes.....	17
MkA—Meikle clay, 0 to 1 percent slopes.....	18
MtB—Montpellier coarse sandy loam, 3 to 8 percent slopes.....	20
MtC2—Montpellier coarse sandy loam, 8 to 15 percent slopes, eroded.....	21
PmC2—Pentz loam, moderately deep, 8 to 15 percent slopes, eroded.....	23
SaB—San Joaquin sandy loams, 3 to 8 percent slopes.....	24
SnA—Snelling sandy loam, 0 to 3 percent slopes.....	25
SnB—Snelling sandy loam, 3 to 8 percent slopes.....	26
TuA—Tujunga loamy sand, 0 to 3 percent slopes.....	28
TvA—Tujunga sand, 0 to 3 percent slopes.....	29
W—Water.....	30
WmC2—Whitney sandy loams, 8 to 15 percent slopes, eroded.....	31
WmD2—Whitney sandy loams, 15 to 30 percent slopes, eroded.....	32
WmE2—Whitney sandy loams, 30 to 45 percent slopes, eroded.....	33
WrB—Whitney and Rocklin sandy loams, 3 to 8 percent slopes.....	34
WrC—Whitney and Rocklin sandy loams, 8 to 15 percent slopes.....	36
Merced Area, California.....	39
AfB—Atwater loamy sand, 3 to 8 percent slopes, MLRA 17.....	39
AgB—Atwater loamy sand, deep over hardpan, 3 to 8 percent slopes.....	40
RkA—Rocklin sandy loam, 0 to 3 percent slopes.....	41
RkB—Rocklin sandy loam, 3 to 8 percent slopes.....	43
RkC2—Rocklin sandy loam, 8 to 15 percent slopes, eroded.....	44
ScA—San Joaquin sandy loam, 0 to 3 percent slopes.....	45
ScB—San Joaquin sandy loam, 3 to 8 percent slopes.....	46
SnB—Snelling sandy loam, 3 to 8 percent slopes.....	48
WhB—Whitney fine sandy loam, 3 to 8 percent slopes.....	49
WmB2—Whitney and Rocklin soils, 3 to 8 percent slopes, eroded.....	50
References	53

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

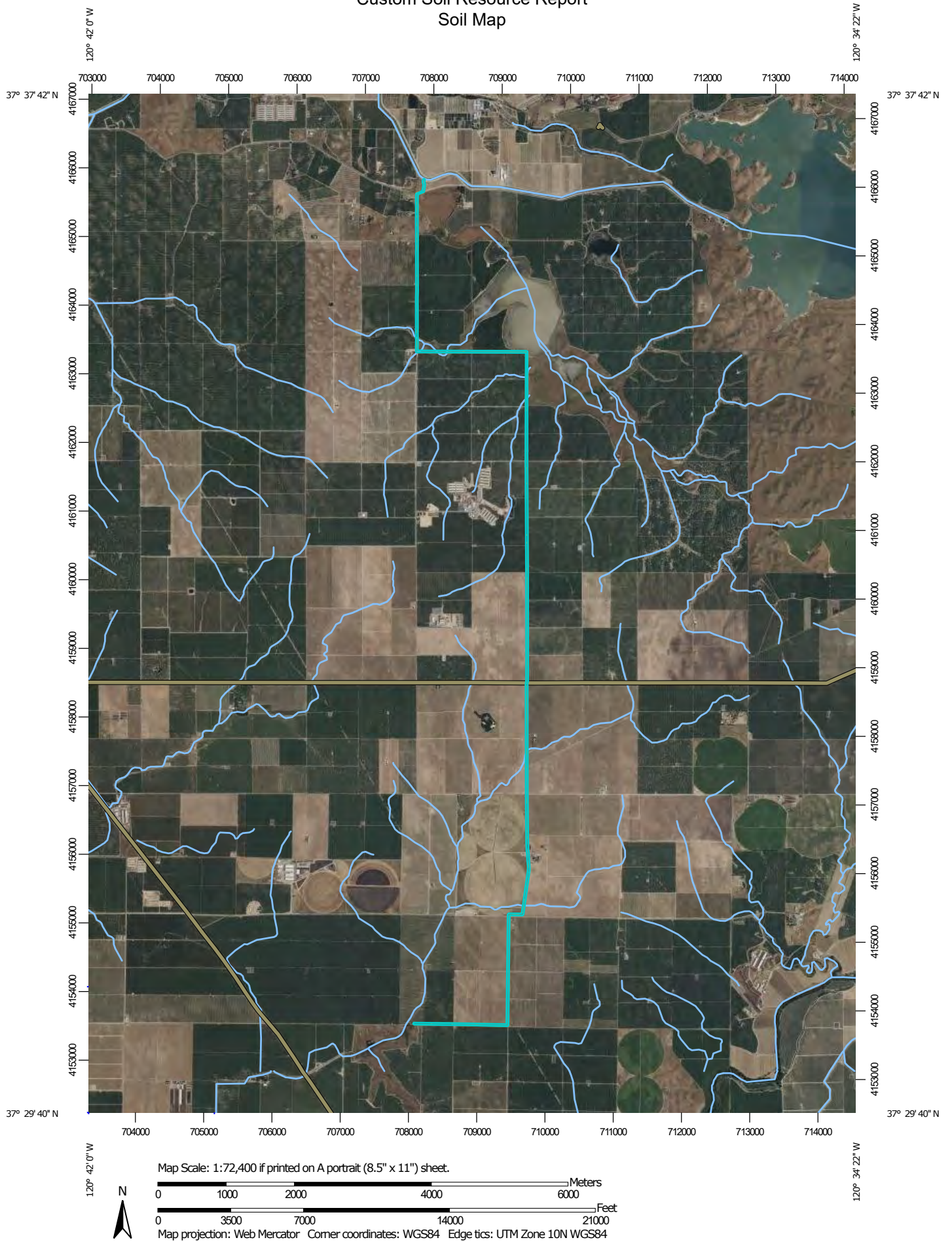
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eastern Stanislaus Area, California

Survey Area Data: Version 19, Sep 2, 2025

Soil Survey Area: Merced Area, California

Survey Area Data: Version 20, Sep 2, 2025

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 11, 2022—May 30, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GsA	Greenfield sandy loam, 0 to 3 percent slopes	3.6	3.0%
GvA	Greenfield sandy loam, deep over hardpan, 0 to 3 percent slopes	9.1	7.7%
HdA	Hanford sandy loam, 0 to 3 percent slopes	2.1	1.8%
MkA	Meikle clay, 0 to 1 percent slopes	1.8	1.5%
MtB	Montpellier coarse sandy loam, 3 to 8 percent slopes	7.3	6.2%
MtC2	Montpellier coarse sandy loam, 8 to 15 percent slopes, eroded	1.8	1.6%
PmC2	Pentz loam, moderately deep, 8 to 15 percent slopes, eroded	8.6	7.3%
SaB	San Joaquin sandy loams, 3 to 8 percent slopes	4.9	4.2%
SnA	Snelling sandy loam, 0 to 3 percent slopes	2.1	1.8%
SnB	Snelling sandy loam, 3 to 8 percent slopes	0.8	0.7%
TuA	Tujunga loamy sand, 0 to 3 percent slopes	1.7	1.4%
TvA	Tujunga sand, 0 to 3 percent slopes	0.4	0.4%
W	Water	0.4	0.4%
WmC2	Whitney sandy loams, 8 to 15 percent slopes, eroded	11.3	9.6%
WmD2	Whitney sandy loams, 15 to 30 percent slopes, eroded	15.0	12.7%
WmE2	Whitney sandy loams, 30 to 45 percent slopes, eroded	0.0	0.0%
WrB	Whitney and Rocklin sandy loams, 3 to 8 percent slopes	4.0	3.4%
WrC	Whitney and Rocklin sandy loams, 8 to 15 percent slopes	2.2	1.9%
Subtotals for Soil Survey Area		77.2	65.7%
Totals for Area of Interest		117.6	100.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AfB	Atwater loamy sand, 3 to 8 percent slopes, MLRA 17	3.8	3.2%

Custom Soil Resource Report

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AgB	Atwater loamy sand, deep over hardpan, 3 to 8 percent slopes	2.7	2.3%
RkA	Rocklin sandy loam, 0 to 3 percent slopes	1.2	1.0%
RkB	Rocklin sandy loam, 3 to 8 percent slopes	6.2	5.3%
RkC2	Rocklin sandy loam, 8 to 15 percent slopes, eroded	0.7	0.6%
ScA	San Joaquin sandy loam, 0 to 3 percent slopes	2.0	1.7%
ScB	San Joaquin sandy loam, 3 to 8 percent slopes	4.6	3.9%
SnB	Snelling sandy loam, 3 to 8 percent slopes	2.3	2.0%
WhB	Whitney fine sandy loam, 3 to 8 percent slopes	0.7	0.6%
WmB2	Whitney and Rocklin soils, 3 to 8 percent slopes, eroded	16.2	13.8%
Subtotals for Soil Survey Area		40.4	34.3%
Totals for Area of Interest		117.6	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a

given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Eastern Stanislaus Area, California

GsA—Greenfield sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hjcj
Elevation: 100 to 3,500 feet
Mean annual precipitation: 9 to 20 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 200 to 300 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Greenfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Greenfield

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

H1 - 0 to 21 inches: fine sandy loam
H2 - 21 to 42 inches: sandy loam
H3 - 42 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: A
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Minor Components

Hanford

Percent of map unit: 10 percent

Custom Soil Resource Report

Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans

Hydric soil rating: No

Snelling

Percent of map unit: 5 percent

Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans

Hydric soil rating: No

GvA—Greenfield sandy loam, deep over hardpan, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hjcl

Elevation: 100 to 3,500 feet

Mean annual precipitation: 9 to 20 inches

Mean annual air temperature: 63 degrees F

Frost-free period: 200 to 300 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Greenfield and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Greenfield

Setting

Landform: Alluvial fans

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

H1 - 0 to 21 inches: sandy loam

H2 - 21 to 40 inches: sandy loam

H3 - 40 to 60 inches: cemented

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 38 to 54 inches to duripan

Drainage class: Well drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: A
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Hanford

Percent of map unit: 10 percent
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Snelling

Percent of map unit: 5 percent
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

HdA—Hanford sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2zy00
Elevation: 30 to 280 feet
Mean annual precipitation: 12 to 19 inches
Mean annual air temperature: 62 to 63 degrees F
Frost-free period: 317 to 331 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hanford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hanford

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 12 inches: sandy loam
C - 12 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Custom Soil Resource Report

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 1 percent

Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): 1

Land capability classification (nonirrigated): 4c

Hydrologic Soil Group: B

Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans

Hydric soil rating: No

Minor Components

Grangeville

Percent of map unit: 5 percent

Landform: Flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans

Hydric soil rating: Yes

Dinuba

Percent of map unit: 5 percent

Landform: Alluvial fans

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans

Hydric soil rating: No

Tujunga

Percent of map unit: 5 percent

Landform: Alluvial fans

Landform position (three-dimensional): Rise

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans

Hydric soil rating: No

MkA—Meikle clay, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: hjf2

Elevation: 100 to 250 feet

Mean annual precipitation: 14 inches

Custom Soil Resource Report

Mean annual air temperature: 64 degrees F
Frost-free period: 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Meikle and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Meikle

Setting

Landform: Basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 4 inches: sandy clay loam
H2 - 4 to 24 inches: clay
H3 - 24 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 0.6 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Ecological site: R017XY901CA - Clayey Basin Group
Hydric soil rating: Yes

Minor Components

Greenfield

Percent of map unit: 5 percent
Hydric soil rating: No

Hanford

Percent of map unit: 5 percent
Hydric soil rating: No

Dinuba

Percent of map unit: 5 percent
Hydric soil rating: No

MtB—Montpellier coarse sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 31wxd
Elevation: 110 to 550 feet
Mean annual precipitation: 13 to 19 inches
Mean annual air temperature: 62 to 63 degrees F
Frost-free period: 300 to 329 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Montpellier and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Montpellier

Setting

Landform: Fan remnants
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 18 inches: coarse sandy loam
BA - 18 to 21 inches: coarse sandy loam
Btq1 - 21 to 28 inches: sandy clay loam
Btq2 - 28 to 40 inches: sandy clay loam
C - 40 to 60 inches: stratified gravelly coarse sandy loam to coarse sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: B
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Minor Components

Snelling

Percent of map unit: 5 percent
Landform: Fan remnants
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Rocklin

Percent of map unit: 4 percent
Landform: Fan remnants
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Whitney

Percent of map unit: 4 percent
Landform: Fan remnants
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Cometa

Percent of map unit: 2 percent
Landform: Fan remnants
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

MtC2—Montpellier coarse sandy loam, 8 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: 31wxh
Elevation: 120 to 590 feet
Mean annual precipitation: 13 to 19 inches
Mean annual air temperature: 62 to 63 degrees F
Frost-free period: 302 to 329 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Montpellier and similar soils: 85 percent

Custom Soil Resource Report

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Montpellier

Setting

Landform: Fan remnants

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 12 inches: coarse sandy loam

BA - 12 to 18 inches: coarse sandy loam

Btq1 - 18 to 25 inches: sandy clay loam

Btq2 - 25 to 37 inches: sandy clay loam

C - 37 to 60 inches: stratified gravelly coarse sandy loam to coarse sandy loam

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): 3s

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: B

Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces

Hydric soil rating: No

Minor Components

Rocklin

Percent of map unit: 5 percent

Landform: Fan remnants

Landform position (three-dimensional): Riser

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R017XY902CA - Duripan Vernal Pools

Hydric soil rating: No

Snelling

Percent of map unit: 5 percent

Landform: Fan remnants

Landform position (three-dimensional): Riser

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R017XY902CA - Duripan Vernal Pools

Hydric soil rating: No

Whitney

Percent of map unit: 5 percent

Landform: Fan remnants

Landform position (three-dimensional): Riser

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R017XY902CA - Duripan Vernal Pools

Hydric soil rating: No

PmC2—Pentz loam, moderately deep, 8 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: hjfv

Elevation: 100 to 600 feet

Mean annual precipitation: 18 inches

Mean annual air temperature: 61 degrees F

Frost-free period: 250 to 300 days

Farmland classification: Not prime farmland

Map Unit Composition

Pentz and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pentz

Setting

Landform: Hillslopes

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Tuffaceous loamy residuum weathered from volcanic sandstone

Typical profile

H1 - 0 to 20 inches: loam

H2 - 20 to 24 inches: weathered bedrock

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: 14 to 25 inches to paralithic bedrock

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Ecological site: R018X163CA - Thermic Low Rolling Hills

Hydric soil rating: No

Minor Components

Raynor

Percent of map unit: 5 percent

Hydric soil rating: No

Peters

Percent of map unit: 5 percent

Hydric soil rating: No

Keyes

Percent of map unit: 5 percent

Hydric soil rating: No

SaB—San Joaquin sandy loams, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: hjgv

Elevation: 20 to 500 feet

Mean annual precipitation: 10 to 22 inches

Mean annual air temperature: 61 to 63 degrees F

Frost-free period: 250 to 300 days

Farmland classification: Not prime farmland

Map Unit Composition

San joaquin and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Joaquin

Setting

Landform: Fan remnants

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 13 inches: sandy loam

H2 - 13 to 24 inches: clay loam

H3 - 24 to 48 inches: indurated

H4 - 48 to 60 inches: sandy loam, sandy clay loam

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches; 20 to 40 inches to duripan

Drainage class: Moderately well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Very low (about 1.6 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: R017XY902CA - Duripan Vernal Pools

Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 5 percent

Landform: Depressions

Hydric soil rating: Yes

Madera

Percent of map unit: 5 percent

Hydric soil rating: No

Alamo

Percent of map unit: 5 percent

Hydric soil rating: No

SnA—Snelling sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hjgy

Elevation: 150 to 2,000 feet

Mean annual precipitation: 12 to 20 inches

Mean annual air temperature: 59 to 63 degrees F

Frost-free period: 250 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Snelling and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Snelling

Setting

Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Concave
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 19 inches: sandy loam
H2 - 19 to 56 inches: sandy clay loam
H3 - 56 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: C
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Minor Components

Montpellier

Percent of map unit: 10 percent
Hydric soil rating: No

Greenfield

Percent of map unit: 5 percent
Hydric soil rating: No

SnB—Snelling sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: hjgz
Elevation: 150 to 2,000 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 59 to 63 degrees F

Custom Soil Resource Report

Frost-free period: 250 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Snelling and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Snelling

Setting

Landform: Fan remnants

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Riser

Down-slope shape: Convex

Across-slope shape: Concave

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 19 inches: sandy loam

H2 - 19 to 56 inches: sandy clay loam

H3 - 56 to 60 inches: sandy loam

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces

Hydric soil rating: No

Minor Components

Montpellier

Percent of map unit: 10 percent

Hydric soil rating: No

Greenfield

Percent of map unit: 5 percent

Hydric soil rating: No

TuA—Tujunga loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2zy01
Elevation: 10 to 280 feet
Mean annual precipitation: 9 to 17 inches
Mean annual air temperature: 62 to 64 degrees F
Frost-free period: 285 to 331 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Tujunga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tujunga

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from granite

Typical profile

Ap - 0 to 10 inches: loamy sand
C - 10 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Minor Components

Hanford

Percent of map unit: 5 percent
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Grangeville

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

Foster

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: Yes

TvA—Tujunga sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hjhl
Elevation: 10 to 2,500 feet
Mean annual precipitation: 10 to 25 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 280 to 350 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Tujunga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tujunga

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise

Custom Soil Resource Report

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from granite

Typical profile

H1 - 0 to 10 inches: sand
H2 - 10 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Minor Components

Hanford

Percent of map unit: 5 percent
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Grangeville

Percent of map unit: 5 percent
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Foster

Percent of map unit: 5 percent
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

W—Water

Map Unit Setting

National map unit symbol: 2kp7t
Elevation: 0 to 70 feet
Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Setting

Landform: Lagoons

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydrologic Soil Group: D

Hydric soil rating: Unranked

WmC2—Whitney sandy loams, 8 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: hjj1

Elevation: 200 to 500 feet

Mean annual precipitation: 15 inches

Mean annual air temperature: 61 degrees F

Frost-free period: 250 to 300 days

Farmland classification: Not prime farmland

Map Unit Composition

Whitney and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whitney

Setting

Landform: Fan remnants

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Riser

Down-slope shape: Convex

Across-slope shape: Concave

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 7 inches: sandy loam

H2 - 7 to 31 inches: sandy loam

H3 - 31 to 35 inches: weathered bedrock

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: 15 to 31 inches to paralithic bedrock

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Custom Soil Resource Report

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Minor Components

Rocklin

Percent of map unit: 10 percent
Hydric soil rating: No

Montpellier

Percent of map unit: 5 percent
Hydric soil rating: No

WmD2—Whitney sandy loams, 15 to 30 percent slopes, eroded

Map Unit Setting

National map unit symbol: hjj3
Elevation: 200 to 500 feet
Mean annual precipitation: 15 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Whitney and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whitney

Setting

Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Concave
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 4 inches: sandy loam
H2 - 4 to 28 inches: sandy loam
H3 - 28 to 32 inches: weathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 15 to 30 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Minor Components

Rocklin

Percent of map unit: 10 percent
Hydric soil rating: No

Montpellier

Percent of map unit: 5 percent
Hydric soil rating: No

WmE2—Whitney sandy loams, 30 to 45 percent slopes, eroded

Map Unit Setting

National map unit symbol: hjj4
Elevation: 200 to 500 feet
Mean annual precipitation: 15 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Whitney and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whitney

Setting

Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser

Custom Soil Resource Report

Down-slope shape: Convex
Across-slope shape: Concave
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 4 inches: sandy loam
H2 - 4 to 28 inches: sandy loam
H3 - 28 to 32 inches: weathered bedrock

Properties and qualities

Slope: 25 to 30 percent
Depth to restrictive feature: 15 to 30 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Minor Components

Rocklin

Percent of map unit: 10 percent
Hydric soil rating: No

Montpellier

Percent of map unit: 5 percent
Hydric soil rating: No

WrB—Whitney and Rocklin sandy loams, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: hjj6
Elevation: 200 to 1,500 feet
Mean annual precipitation: 15 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Whitney and similar soils: 55 percent
Rocklin and similar soils: 30 percent

Custom Soil Resource Report

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whitney

Setting

Landform: Fan remnants

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Riser

Down-slope shape: Convex

Across-slope shape: Concave

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 7 inches: sandy loam

H2 - 7 to 31 inches: sandy loam

H3 - 31 to 35 inches: weathered bedrock

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces

Hydric soil rating: No

Description of Rocklin

Setting

Landform: Fan remnants

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Riser

Down-slope shape: Convex

Across-slope shape: Concave

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 9 inches: sandy loam

H2 - 9 to 17 inches: sandy loam

H3 - 17 to 28 inches: sandy clay loam

H4 - 28 to 34 inches: indurated

H5 - 34 to 60 inches: coarse sandy loam, fine sandy loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 20 to 40 inches to duripan

Drainage class: Well drained

Custom Soil Resource Report

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: R017XY902CA - Duripan Vernal Pools

Hydric soil rating: No

Minor Components

Montpellier

Percent of map unit: 10 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 5 percent

Hydric soil rating: No

WrC—Whitney and Rocklin sandy loams, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: hjj7

Elevation: 200 to 1,500 feet

Mean annual precipitation: 15 inches

Mean annual air temperature: 61 degrees F

Frost-free period: 250 to 300 days

Farmland classification: Not prime farmland

Map Unit Composition

Whitney and similar soils: 60 percent

Rocklin and similar soils: 25 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whitney

Setting

Landform: Fan remnants

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Riser

Down-slope shape: Convex

Across-slope shape: Concave

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 31 inches: fine sandy loam
H3 - 31 to 35 inches: weathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Description of Rocklin

Setting

Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Concave
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 9 inches: sandy loam
H2 - 9 to 17 inches: sandy loam
H3 - 17 to 28 inches: sandy clay loam
H4 - 28 to 34 inches: indurated
H5 - 34 to 60 inches: coarse sandy loam, fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C

Custom Soil Resource Report

Ecological site: R017XY902CA - Duripan Vernal Pools

Hydric soil rating: No

Minor Components

Montpellier

Percent of map unit: 10 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 5 percent

Hydric soil rating: No

Merced Area, California

AfB—Atwater loamy sand, 3 to 8 percent slopes, MLRA 17

Map Unit Setting

National map unit symbol: 2vnd4
Elevation: 120 to 460 feet
Mean annual precipitation: 11 to 14 inches
Mean annual air temperature: 62 to 64 degrees F
Frost-free period: 240 to 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Atwater and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Atwater

Setting

Landform: Dunes
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits derived from alluvium derived from granite

Typical profile

Ap - 0 to 24 inches: loamy sand
Bt - 24 to 39 inches: sandy loam
C - 39 to 73 inches: sandy loam
2Bq - 73 to 79 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 60 to 79 inches to cemented horizon
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.02 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Delhi

Percent of map unit: 5 percent

Custom Soil Resource Report

Landform: Dunes
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Rocklin

Percent of map unit: 4 percent
Landform: Terraces, fan remnants
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

San joaquin

Percent of map unit: 4 percent
Landform: Fan remnants, terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Whitney

Percent of map unit: 2 percent
Landform: Terraces, fan remnants
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

AgB—Atwater loamy sand, deep over hardpan, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: hjr8
Elevation: 500 feet
Mean annual precipitation: 15 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 250 to 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Atwater and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Atwater

Setting

Landform: Dunes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf

Custom Soil Resource Report

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from granite

Typical profile

H1 - 0 to 20 inches: loamy sand
H2 - 20 to 42 inches: sandy loam
H3 - 42 to 60 inches: cemented

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 40 to 60 inches to duripan
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Delhi

Percent of map unit: 5 percent
Hydric soil rating: No

Rocklin

Percent of map unit: 5 percent
Hydric soil rating: No

San joaquin

Percent of map unit: 5 percent
Hydric soil rating: No

RkA—Rocklin sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hjy1
Elevation: 300 to 1,500 feet
Mean annual precipitation: 15 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Rocklin and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rocklin

Setting

Landform: Fan remnants

Landform position (two-dimensional): Backslope, toeslope

Landform position (three-dimensional): Riser, tread

Down-slope shape: Convex, linear

Across-slope shape: Concave, linear

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 8 inches: sandy loam

H2 - 8 to 24 inches: loam

H3 - 24 to 28 inches: indurated

H4 - 28 to 60 inches: stratified coarse sandy loam to fine sandy loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 20 to 40 inches to duripan

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 3s

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: C

Ecological site: R017XY902CA - Duripan Vernal Pools

Hydric soil rating: No

Minor Components

Whitney

Percent of map unit: 10 percent

Hydric soil rating: No

Montpellier

Percent of map unit: 5 percent

Hydric soil rating: No

RkB—Rocklin sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: hly2
Elevation: 300 to 1,500 feet
Mean annual precipitation: 15 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Rocklin and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rocklin

Setting

Landform: Fan remnants
Landform position (two-dimensional): Backslope, toeslope
Landform position (three-dimensional): Riser, tread
Down-slope shape: Convex, linear
Across-slope shape: Concave, linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 24 inches: loam
H3 - 24 to 28 inches: indurated
H4 - 28 to 60 inches: stratified coarse sandy loam to fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Minor Components

Whitney

Percent of map unit: 10 percent

Hydric soil rating: No

Montpellier

Percent of map unit: 5 percent

Hydric soil rating: No

RkC2—Rocklin sandy loam, 8 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: hjy4

Elevation: 300 to 1,500 feet

Mean annual precipitation: 15 inches

Mean annual air temperature: 61 degrees F

Frost-free period: 250 days

Farmland classification: Not prime farmland

Map Unit Composition

Rocklin and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rocklin

Setting

Landform: Fan remnants

Landform position (two-dimensional): Backslope, toeslope

Landform position (three-dimensional): Riser, tread

Down-slope shape: Convex, linear

Across-slope shape: Concave, linear

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 8 inches: sandy loam

H2 - 8 to 24 inches: loam

H3 - 24 to 28 inches: indurated

H4 - 28 to 60 inches: stratified coarse sandy loam to fine sandy loam

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: 20 to 40 inches to duripan

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Custom Soil Resource Report

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: R017XY902CA - Duripan Vernal Pools

Hydric soil rating: No

Minor Components

Whitney

Percent of map unit: 10 percent

Hydric soil rating: No

Montpellier

Percent of map unit: 5 percent

Hydric soil rating: No

ScA—San Joaquin sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 30r90

Elevation: 140 to 390 feet

Mean annual precipitation: 12 to 15 inches

Mean annual air temperature: 62 to 64 degrees F

Frost-free period: 297 to 328 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

San joaquin and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Joaquin

Setting

Landform: Fan remnants, terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 9 inches: sandy loam

Bt1 - 9 to 15 inches: sandy clay loam

2Bt2 - 15 to 21 inches: clay

2Bkqm - 21 to 37 inches: cemented material

2C - 37 to 79 inches: loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 9 inches to abrupt textural change; 19 to 25 inches to duripan

Drainage class: Moderately well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)

Depth to water table: About 8 to 9 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: Very low (about 0.8 inches)

Interpretive groups

Land capability classification (irrigated): 4s

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: D

Ecological site: R017XY902CA - Duripan Vernal Pools

Hydric soil rating: No

Minor Components

Snelling

Percent of map unit: 5 percent

Landform: Fan remnants

Landform position (three-dimensional): Riser

Down-slope shape: Convex

Across-slope shape: Concave

Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces

Hydric soil rating: No

Alamo

Percent of map unit: 5 percent

Landform: Fan remnants

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R017XY907CA - Aridic Alkali Desert

Hydric soil rating: Yes

ScB—San Joaquin sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2zxzs

Elevation: 120 to 280 feet

Mean annual precipitation: 13 to 15 inches

Mean annual air temperature: 62 to 63 degrees F

Frost-free period: 319 to 327 days

Custom Soil Resource Report

Farmland classification: Farmland of statewide importance

Map Unit Composition

San joaquin and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Joaquin

Setting

Landform: Terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Coarse-loamy alluvium derived from granite

Typical profile

Ap - 0 to 9 inches: sandy loam

BA - 9 to 15 inches: sandy clay loam

2Bt - 15 to 21 inches: clay

2Bkqm - 21 to 37 inches: cemented material

C - 37 to 60 inches: stratified sandy loam to loam

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: 15 inches to abrupt textural change; 21 inches to duripan

Drainage class: Moderately well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Hydric soil rating: No

Minor Components

Snelling

Percent of map unit: 5 percent

Landform: Fan remnants

Landform position (three-dimensional): Riser

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Alamo

Percent of map unit: 5 percent

Landform: Fan remnants

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Custom Soil Resource Report

Across-slope shape: Linear
Ecological site: R017XY907CA - Aridic Alkali Desert
Hydric soil rating: Yes

Montpellier

Percent of map unit: 5 percent
Landform: Fan remnants
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

SnB—Snelling sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: hjyx
Elevation: 150 to 2,000 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 250 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Snelling and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Snelling

Setting

Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Concave
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 22 inches: sandy loam
H2 - 22 to 50 inches: sandy clay loam
H3 - 50 to 60 inches: sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Custom Soil Resource Report

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces

Hydric soil rating: No

Minor Components

Greenfield

Percent of map unit: 5 percent

Hydric soil rating: No

Montpellier

Percent of map unit: 5 percent

Hydric soil rating: No

Peters

Percent of map unit: 5 percent

Hydric soil rating: No

WhB—Whitney fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: hk01

Elevation: 200 to 500 feet

Mean annual precipitation: 15 inches

Mean annual air temperature: 61 degrees F

Frost-free period: 250 to 300 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Whitney and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whitney

Setting

Landform: Fan remnants

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Riser

Down-slope shape: Convex

Across-slope shape: Concave

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 15 inches: fine sandy loam

Custom Soil Resource Report

H2 - 15 to 27 inches: fine sandy loam

H3 - 27 to 31 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces

Hydric soil rating: No

Minor Components

Rocklin

Percent of map unit: 10 percent

Hydric soil rating: No

Montpellier

Percent of map unit: 5 percent

Hydric soil rating: No

WmB2—Whitney and Rocklin soils, 3 to 8 percent slopes, eroded

Map Unit Setting

National map unit symbol: hk0c

Elevation: 200 to 1,500 feet

Mean annual precipitation: 15 inches

Mean annual air temperature: 61 degrees F

Frost-free period: 250 to 300 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Whitney and similar soils: 50 percent

Rocklin and similar soils: 40 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whitney

Setting

Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Concave
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 15 inches: fine sandy loam
H2 - 15 to 27 inches: fine sandy loam
H3 - 27 to 59 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Description of Rocklin

Setting

Landform: Fan remnants
Landform position (two-dimensional): Backslope, toeslope
Landform position (three-dimensional): Riser, tread
Down-slope shape: Convex, linear
Across-slope shape: Concave, linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 24 inches: loam
H3 - 24 to 28 inches: indurated
H4 - 28 to 60 inches: stratified coarse sandy loam to fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)
Depth to water table: More than 80 inches

Custom Soil Resource Report

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: R017XY902CA - Duripan Vernal Pools

Hydric soil rating: No

Minor Components

Montpellier

Percent of map unit: 10 percent

Hydric soil rating: No

References

- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelpdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

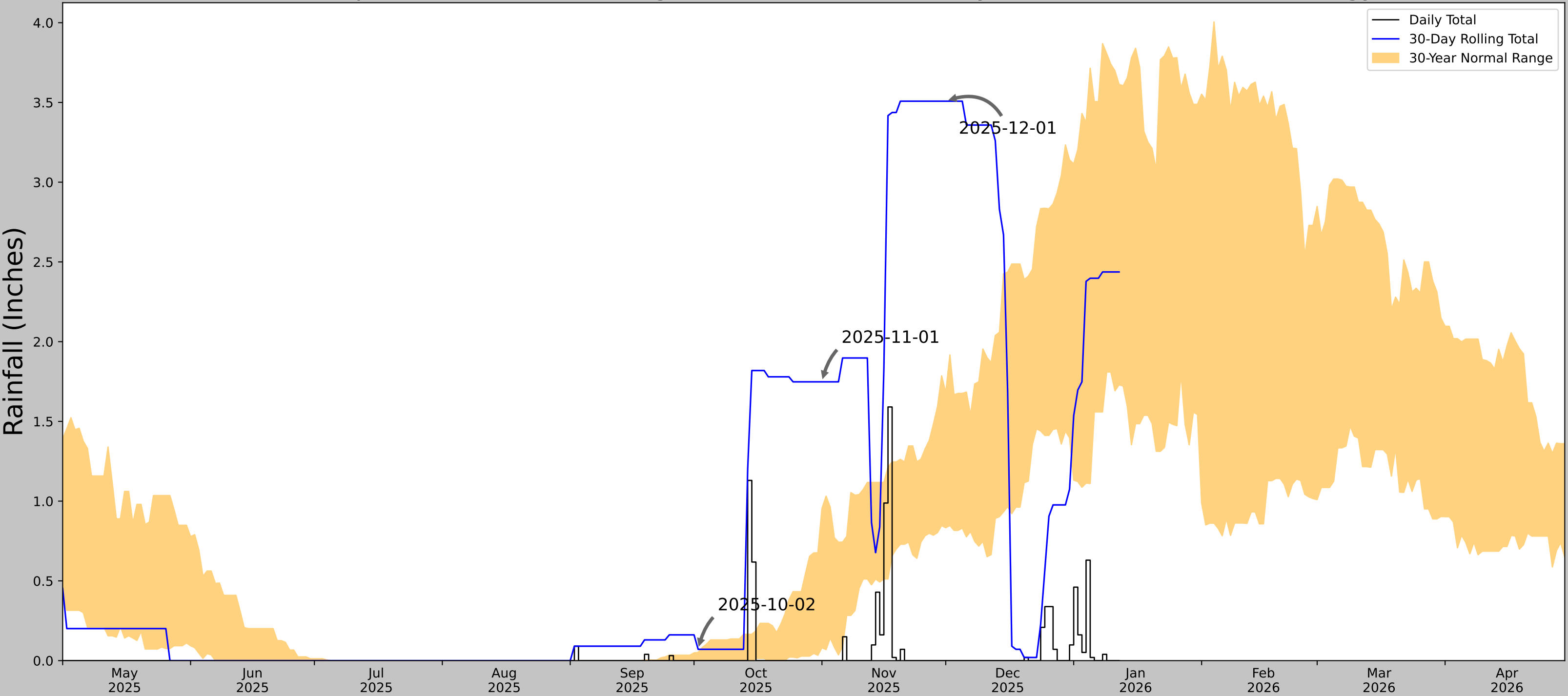
United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Appendix B

Climatological Data

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	37.52301, -120.62764
Observation Date	2025-12-01
Elevation (ft)	224.344
Drought Index (PDSI)	Mild wetness
WebWIMP H ₂ O Balance	Wet Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2025-12-01	0.833071	1.681102	3.507874	Wet	3	3	9
2025-11-01	0.080709	0.954331	1.748032	Wet	3	2	6
2025-10-02	0.0	0.051181	0.070866	Wet	3	1	3
Result							Wetter than Normal - 18



US Army Corps
of Engineers



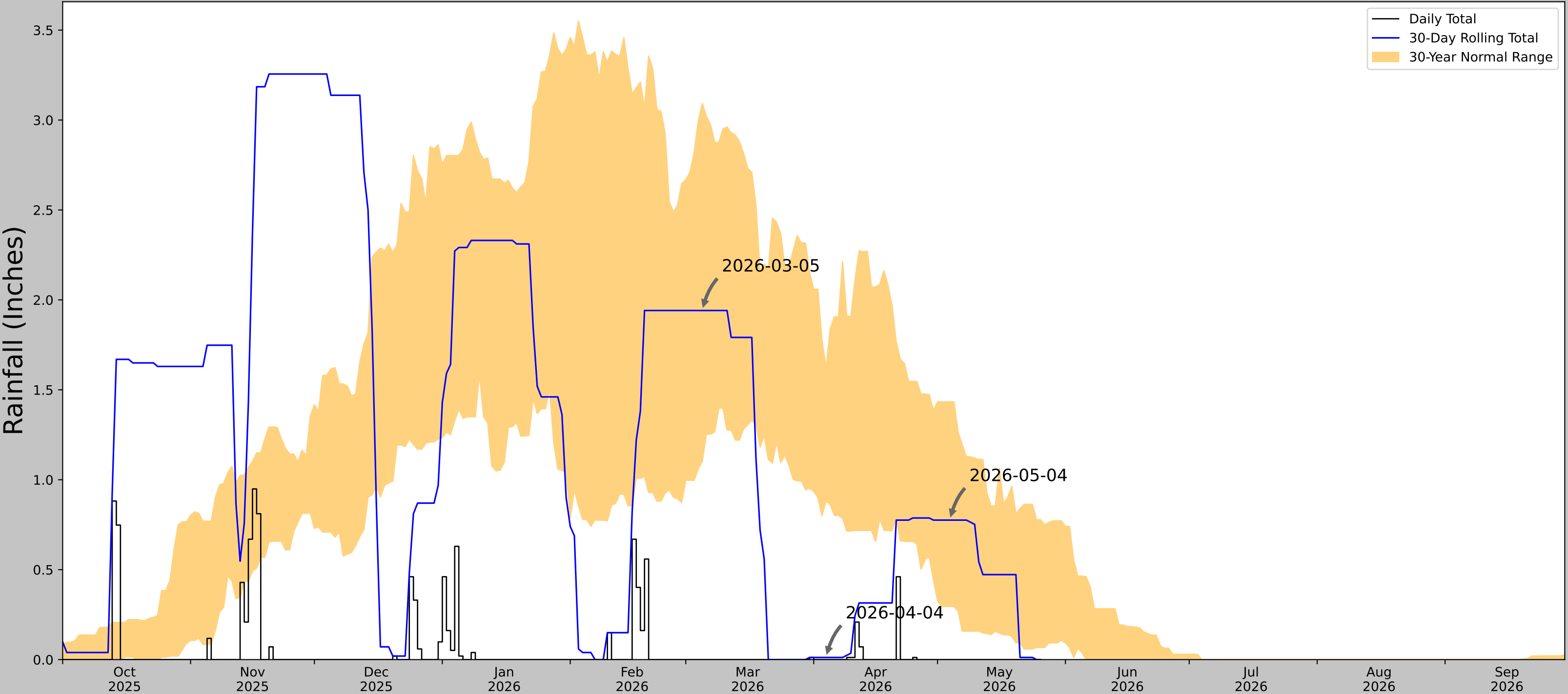
ERDC
ENGINEERING RESEARCH AND DEVELOPMENT CENTER

Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
MERCED	37.2889, -120.5158	153.871	17.301	70.473	9.005	10323	84
MERCED MUNI AP	37.2858, -120.5178	151.903	0.241	1.968	0.109	1027	6
MERCED 1.2 NW	37.3102, -120.4968	167.979	1.805	14.108	0.838	3	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	37.51066, -120.64422
Observation Date	2026-05-04
Elevation (ft)	192.953
Drought Index (PDSI)	Mild drought (2026-04)
WebWIMP H ₂ O Balance	Dry Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2026-05-04	0.295276	1.433465	0.775591	Normal	2	3	6
2026-04-04	0.881102	1.622441	0.011811	Dry	1	2	2
2026-03-05	1.102756	3.091732	1.940945	Normal	2	1	2
Result							Normal Conditions - 10



US Army Corps
of Engineers



ERDC

Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
MERCED MUNI AP	37.2858, -120.5178	151.903	17.016	41.05	8.356	9905	90
MERCED	37.2889, -120.5158	153.871	0.241	1.968	0.109	1445	0
MERCED 1.2 NW	37.3102, -120.4968	167.979	2.043	16.076	0.952	3	0

Appendix C

Data Sheets

SOIL

Sampling Point: DP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-7	10YR 3/2	95	2.5YR 5/8	5	C	M	Clay loam	Recent rain
7-15	10YR 3/2	90	5YR 5/8	10	C	M	Clay loam	Recent rain
15-18	10YR 3/2	30	2.5YR 4/6	70	C	M	Clay loam	Recent rain
-								
-								
-								
-								
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.							² Location: PL=Pore Lining, M=Matrix.	
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)							Indicators for Problematic Hydric Soils³:	
Histosol (A1)			Sandy Gleyed Matrix (S4)				1 cm Muck (A9) (LRR C)	
Histic Epipedon (A2)			Sandy Redox (S5)				2 cm Muck (A10) (LRR B)	
Black Histic (A3)			Stripped Matrix (S6)				Iron-Manganese Masses (F12) (LRR D)	
Hydrogen Sulfide (A4)			Loamy Mucky Mineral (F1)				Reduced Vertic (F18)	
Stratified Layers (A5) (LRR C)			Loamy Gleyed Matrix (F2)				Red Parent Material (F21)	
1 cm Muck (A9) (LRR D)			Depleted Matrix (F3)				Very Shallow Dark Surface (F22)	
Depleted Below Dark Surface (A11)			X Redox Dark Surface (F6)				Other (Explain in Remarks)	
Thick Dark Surface (A12)			Depleted Dark Surface (F7)				³ Indicators of hydrophytic vegetation and	
Iron Monosulfide (A18)			Redox Depressions (F8)				wetland hydrology must be present,	
Sandy Mucky Mineral (S1)							unless disturbed or problematic.	
Restrictive Layer (if observed):								
Type: _____								
Depth (inches): _____						Hydric Soil Present? Yes X No		
Remarks:								

HYDROLOGY

Wetland Hydrology Indicators:											
Primary Indicators (minimum of one is required; check all that apply)					Secondary Indicators (2 or more required)						
☒	Surface Water (A1)			☐	Salt Crust (B11)			☐	Water Marks (B1) (Riverine)		
☐	High Water Table (A2)			☐	Biotic Crust (B12)			☐	Sediment Deposits (B2) (Riverine)		
☒	Saturation (A3)			☐	Aquatic Invertebrates (B13)			☐	Drift Deposits (B3) (Riverine)		
☐	Water Marks (B1) (Nonriverine)			☐	Hydrogen Sulfide Odor (C1)			☒	Drainage Patterns (B10)		
☐	Sediment Deposits (B2) (Nonriverine)			☐	Oxidized Rhizospheres on Living Roots (C3)			☐	Dry-Season Water Table (C2)		
☐	Drift Deposits (B3) (Nonriverine)			☐	Presence of Reduced Iron (C4)			☐	Crayfish Burrows (C8)		
☐	Surface Soil Cracks (B6)			☐	Recent Iron Reduction in Tilled Soils (C6)			☐	Saturation Visible on Aerial Imagery (C9)		
☐	Inundation Visible on Aerial Imagery (B7)			☐	Stunted or Stressed Plants (D1) (LRR A)			☐	Shallow Aquitard (D3)		
☐	Water-Stained Leaves (B9) (except			☐	Other (Explain in Remarks)			☐	FAC-Neutral Test (D5)		
Field Observations:					Wetland Hydrology Present? Yes ☒ No ☐						
Surface Water Present?	Yes	☒	No	☐						Depth (inches):	<u>3</u>
Water Table Present?	Yes	☒	No	☐						Depth (inches):	<u>18</u>
Saturation Present?	Yes	☒	No	☐						Depth (inches):	<u>0</u>
(includes capillary fringe)											
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:											
Remarks:											

SOIL

Sampling Point: DP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	5YR 4/3	80	7.5YR 5/8	20	C	M	Sandy clay loam	
6-16	10YR 3/2	95	5YR 5/8	5	C	PL	Loam	
-								
-								
-								
-								
-								
-								
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.						² Location: PL=Pore Lining, M=Matrix.		
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)							Indicators for Problematic Hydric Soils³:	
Histosol (A1)			Sandy Gleyed Matrix (S4)				1 cm Muck (A9) (LRR C)	
Histic Epipedon (A2)			Sandy Redox (S5)				2 cm Muck (A10) (LRR B)	
Black Histic (A3)			Stripped Matrix (S6)				Iron-Manganese Masses (F12) (LRR D)	
Hydrogen Sulfide (A4)			Loamy Mucky Mineral (F1)				Reduced Vertic (F18)	
Stratified Layers (A5) (LRR C)			Loamy Gleyed Matrix (F2)				Red Parent Material (F21)	
1 cm Muck (A9) (LRR D)			Depleted Matrix (F3)				Very Shallow Dark Surface (F22)	
Depleted Below Dark Surface (A11)			Redox Dark Surface (F6)				Other (Explain in Remarks)	
Thick Dark Surface (A12)			Depleted Dark Surface (F7)				³ Indicators of hydrophytic vegetation and	
Iron Monosulfide (A18)			Redox Depressions (F8)				wetland hydrology must be present,	
Sandy Mucky Mineral (S1)							unless disturbed or problematic.	
Restrictive Layer (if observed):								
Type: _____								
Depth (inches): _____						Hydric Soil Present?		
						Yes		
						No		
						X		
Remarks:								

HYDROLOGY

Wetland Hydrology Indicators:									
Primary Indicators (minimum of one is required; check all that apply)					Secondary Indicators (2 or more required)				
☐ Surface Water (A1)					☐ Salt Crust (B11)			☐ Water Marks (B1)	(Riverine)
☐ High Water Table (A2)					☐ Biotic Crust (B12)			☐ Sediment Deposits (B2)	(Riverine)
☐ Saturation (A3)					☐ Aquatic Invertebrates (B13)			☐ Drift Deposits (B3)	(Riverine)
☐ Water Marks (B1)	(Nonriverine)				☐ Hydrogen Sulfide Odor (C1)			☐ Drainage Patterns (B10)	
☐ Sediment Deposits (B2)	(Nonriverine)				☐ Oxidized Rhizospheres on Living Roots (C3)			☐ Dry-Season Water Table (C2)	
☐ Drift Deposits (B3)	(Nonriverine)				☐ Presence of Reduced Iron (C4)			☐ Crayfish Burrows (C8)	
☐ Surface Soil Cracks (B6)					☐ Recent Iron Reduction in Tilled Soils (C6)			☐ Saturation Visible on Aerial Imagery (C9)	
☐ Inundation Visible on Aerial Imagery (B7)					☐ Stunted or Stressed Plants (D1) (LRR A)			☐ Shallow Aquitard (D3)	
☐ Water-Stained Leaves (B9) (except					☐ Other (Explain in Remarks)			☐ FAC-Neutral Test (D5)	
Field Observations:									
Surface Water Present?	Yes	☐	No	☒	Depth (inches):				
Water Table Present?	Yes	☐	No	☒	Depth (inches):	☐			
Saturation Present?	Yes	☐	No	☒	Depth (inches):	☐			
(includes capillary fringe)									
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:									
Remarks:									

SOIL

Sampling Point: DP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 2/2	100					Sandy loam	Seasonal burn
6-18	10YR 3/2	99	5YR 4/6	1	C	M	Sandy clay loam	Seasonal burn
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

☐ Histosol (A1)	☐ Sandy Gleyed Matrix (S4)	☐ 1 cm Muck (A9) (LRR C)
☐ Histic Epipedon (A2)	☐ Sandy Redox (S5)	☐ 2 cm Muck (A10) (LRR B)
☐ Black Histic (A3)	☐ Stripped Matrix (S6)	☐ Iron-Manganese Masses (F12) (LRR D)
☐ Hydrogen Sulfide (A4)	☐ Loamy Mucky Mineral (F1)	☐ Reduced Vertic (F18)
☐ Stratified Layers (A5) (LRR C)	☐ Loamy Gleyed Matrix (F2)	☐ Red Parent Material (F21)
☐ 1 cm Muck (A9) (LRR D)	☐ Depleted Matrix (F3)	☐ Very Shallow Dark Surface (F22)
☐ Depleted Below Dark Surface (A11)	☐ Redox Dark Surface (F6)	☐ Other (Explain in Remarks)
☐ Thick Dark Surface (A12)	☐ Depleted Dark Surface (F7)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
☐ Iron Monosulfide (A18)	☐ Redox Depressions (F8)	
☐ Sandy Mucky Mineral (S1)		

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? Yes ☐ No ☐ X ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

Secondary Indicators (2 or more required)

☐ Surface Water (A1)	☐ Salt Crust (B11)	☐ Water Marks (B1) (Riverine)
☐ High Water Table (A2)	☐ Biotic Crust (B12)	☐ Sediment Deposits (B2) (Riverine)
☐ Saturation (A3)	☐ Aquatic Invertebrates (B13)	☐ Drift Deposits (B3) (Riverine)
☐ Water Marks (B1) (Nonriverine)	☐ Hydrogen Sulfide Odor (C1)	☐ Drainage Patterns (B10)
☐ Sediment Deposits (B2) (Nonriverine)	☐ Oxidized Rhizospheres on Living Roots (C3)	☐ Dry-Season Water Table (C2)
☐ Drift Deposits (B3) (Nonriverine)	☐ Presence of Reduced Iron (C4)	☐ Crayfish Burrows (C8)
☐ Surface Soil Cracks (B6)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Saturation Visible on Aerial Imagery (C9)
☐ Inundation Visible on Aerial Imagery (B7)	☐ Stunted or Stressed Plants (D1) (LRR A)	☐ Shallow Aquitard (D3)
☐ Water-Stained Leaves (B9) (except	☐ Other (Explain in Remarks)	☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches):	Wetland Hydrology Present? Yes ☐ No ☐ X ☐
Water Table Present?	Yes ☐	No ☒	Depth (inches):	
Saturation Present?	Yes ☐	No ☒	Depth (inches):	
(includes capillary fringe)				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SOIL

Sampling Point: DP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 3/3	100					Sandy clay loam	Seasonal debris burn
8-16	10YR 2/1	99	7.5YR 5/8	1	C	M	Clay loam	Seasonal debris burn
-								
-								
-								
-								
-								
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix.								
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)					Indicators for Problematic Hydric Soils ³ :			
☐ Histosol (A1)			☐ Sandy Gleyed Matrix (S4)			☐ 1 cm Muck (A9) (LRR C)		
☐ Histic Epipedon (A2)			☐ Sandy Redox (S5)			☐ 2 cm Muck (A10) (LRR B)		
☐ Black Histic (A3)			☐ Stripped Matrix (S6)			☐ Iron-Manganese Masses (F12) (LRR D)		
☐ Hydrogen Sulfide (A4)			☐ Loamy Mucky Mineral (F1)			☐ Reduced Vertic (F18)		
☐ Stratified Layers (A5) (LRR C)			☐ Loamy Gleyed Matrix (F2)			☐ Red Parent Material (F21)		
☐ 1 cm Muck (A9) (LRR D)			☐ Depleted Matrix (F3)			☐ Very Shallow Dark Surface (F22)		
☐ Depleted Below Dark Surface (A11)			☐ Redox Dark Surface (F6)			☐ Other (Explain in Remarks)		
☐ Thick Dark Surface (A12)			☐ Depleted Dark Surface (F7)			³ Indicators of hydrophytic vegetation and		
☐ Iron Monosulfide (A18)			☐ Redox Depressions (F8)			wetland hydrology must be present,		
☐ Sandy Mucky Mineral (S1)						unless disturbed or problematic.		
Restrictive Layer (if observed):								
Type: _____								
Depth (inches): _____						Hydric Soil Present? Yes No X		
Remarks:								

HYDROLOGY

Wetland Hydrology Indicators:					
Primary Indicators (minimum of one is required; check all that apply)				Secondary Indicators (2 or more required)	
☐ Surface Water (A1)		☐ Salt Crust (B11)		☐ Water Marks (B1) (Riverine)	
☐ High Water Table (A2)		☐ Biotic Crust (B12)		☐ Sediment Deposits (B2) (Riverine)	
☐ Saturation (A3)		☐ Aquatic Invertebrates (B13)		☐ Drift Deposits (B3) (Riverine)	
☐ Water Marks (B1) (Nonriverine)		☐ Hydrogen Sulfide Odor (C1)		☐ Drainage Patterns (B10)	
☐ Sediment Deposits (B2) (Nonriverine)		☐ Oxidized Rhizospheres on Living Roots (C3)		☐ Dry-Season Water Table (C2)	
☐ Drift Deposits (B3) (Nonriverine)		☐ Presence of Reduced Iron (C4)		☐ Crayfish Burrows (C8)	
☐ Surface Soil Cracks (B6)		☐ Recent Iron Reduction in Tilled Soils (C6)		☐ Saturation Visible on Aerial Imagery (C9)	
☐ Inundation Visible on Aerial Imagery (B7)		☐ Stunted or Stressed Plants (D1) (LRR A)		☐ Shallow Aquitard (D3)	
☐ Water-Stained Leaves (B9) (except		☐ Other (Explain in Remarks)		☐ FAC-Neutral Test (D5)	
Field Observations:					
Surface Water Present?	Yes ☐ No ☒	Depth (inches):		Wetland Hydrology Present? Yes ☐ No ☒	
Water Table Present?	Yes ☐ No ☒	Depth (inches):			
Saturation Present?	Yes ☐ No ☒	Depth (inches):			
(includes capillary fringe)					
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:					
Remarks:					
Irrigation lines present					

OMB Contr ol #: 0710-0024, Exp: 9/30/202

Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)

See ERDC/EL TR-08-28; the proponent agency is CECW-CO-R

Are climatic / hydrologic conditions on the site typical for this time of year?				Yes	<u>X</u>	No	_____	(If no, explain in Remarks.)	_____		
Are Vegetation	<u>no</u>	, Soil	<u>no</u>	, or Hydrology	<u>no</u>	significantly disturbed?	Are "Normal Circumstances" present?	Yes	<u>X</u>	No	_____
Are Vegetation	<u>no</u>	, Soil	<u>no</u>	, or Hydrology	<u>no</u>	naturally problematic?	(If needed, explain any answers in Remarks.)				

Hydrophytic Vegetation Present?	Yes	No	X	Is the Sampled Area			
				within a Wetland?	Yes	No	X
Hydric Soil Present?	Yes	No	X				
Wetland Hydrology Present?	Yes	No	X				

Remarks:

Tree Stratum		(Plot size: 30)		Absolute % Cover	Dominant Species?	Indicator Status
1.						
2.						
3.						
4.						
				0	=Total Cover	
Sapling/Shrub Stratum		(Plot size: 30)				
1.						
2.						
3.						
4.						
5.						
				0	=Total Cover	
Herb Stratum		(Plot size: 5)				
1.	Lolium perenne	20	yes	FAC		
2.	Erigeron bonariensis	10	no	FACU		
3.	Poa pratensis	10	no	FAC		
4.	Erigeron canadensis	1	no	FACU		
5.	Matricaria discoidea	3	no	FACU		
6.	Croton setigerus	12	yes	UPL		
7.						
8.						
				56	=Total Cover	
Woody Vine Stratum		(Plot size: 30)				
1.						
2.						
				0	=Total Cover	

Dominance Test worksheet:			
Number of Dominant Species That Are OBL, FACW,			
1			(A)
Total Number of Dominant Species Across All Strata:			
2			(B)
Percent of Dominant Species That Are OBL, FACW,			
50			(A/B)

Prevalence Index worksheet:			
Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	14	x 4 =	56
UPL species	12	x 5 =	60
Column Totals:	56 (A)		206 (B)
Prevalence Index = B/A =		3.68	

Hydrophytic Vegetation Indicators:	
Dominance Test is >50%	
Prevalence Index is ≤3.0 ¹	
Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
Problematic Hydrophytic Vegetation ¹ (Explain)	
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	

Hydrophytic Vegetation Present?	
Yes	No
	X

Remarks:

SOIL

Sampling Point:

DP5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)									
Depth	Matrix		Redox Features						
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks	
0-14	7.5YR 3/2	100					Sandy loam		
-									
-									
-									
-									
-									
-									
-									
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.							² Location: PL=Pore Lining, M=Matrix.		
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)									
Histosol (A1)			Sandy Gleyed Matrix (S4)				Indicators for Problematic Hydric Soils ³ :		
Histic Epipedon (A2)			Sandy Redox (S5)				1 cm Muck (A9) (LRR C)		
Black Histic (A3)			Stripped Matrix (S6)				2 cm Muck (A10) (LRR B)		
Hydrogen Sulfide (A4)			Loamy Mucky Mineral (F1)				Iron-Manganese Masses (F12) (LRR D)		
Stratified Layers (A5) (LRR C)			Loamy Gleyed Matrix (F2)				Reduced Vertic (F18)		
1 cm Muck (A9) (LRR D)			Depleted Matrix (F3)				Red Parent Material (F21)		
Depleted Below Dark Surface (A11)			Redox Dark Surface (F6)				Very Shallow Dark Surface (F22)		
Thick Dark Surface (A12)			Depleted Dark Surface (F7)				Other (Explain in Remarks)		
Iron Monosulfide (A18)			Redox Depressions (F8)				³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.		
Sandy Mucky Mineral (S1)									
Restrictive Layer (if observed):									
Type: _____									
Depth (inches): _____							Hydric Soil Present? Yes No X		
Remarks:									
HYDROLOGY									
Wetland Hydrology Indicators:									
Primary Indicators (minimum of one is required; check all that apply)					Secondary Indicators (2 or more required)				
Surface Water (A1)			Salt Crust (B11)		Water Marks (B1) (Riverine)				
High Water Table (A2)			Biotic Crust (B12)		Sediment Deposits (B2) (Riverine)				
Saturation (A3)			Aquatic Invertebrates (B13)		Drift Deposits (B3) (Riverine)				
Water Marks (B1) (Nonriverine)			Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)				
Sediment Deposits (B2) (Nonriverine)			Oxidized Rhizospheres on Living Roots (C3)		Dry-Season Water Table (C2)				
Drift Deposits (B3) (Nonriverine)			Presence of Reduced Iron (C4)		Crayfish Burrows (C8)				
Surface Soil Cracks (B6)			Recent Iron Reduction in Tilled Soils (C6)		Saturation Visible on Aerial Imagery (C9)				
Inundation Visible on Aerial Imagery (B7)			Stunted or Stressed Plants (D1) (LRR A)		Shallow Aquitard (D3)				
Water-Stained Leaves (B9) (except			Other (Explain in Remarks)		FAC-Neutral Test (D5)				
Field Observations:									
Surface Water Present?		Yes	No	X	Depth (inches):		Wetland Hydrology Present? Yes No X		
Water Table Present?		Yes	No	X	Depth (inches):				
Saturation Present?		Yes	No	X	Depth (inches):				
(includes capillary fringe)									
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:									
Remarks:									

OMB Control #: 0710-0024, Exp: 9/30/202
Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)

See ERDC/EL TR-08-28; the proponent agency is CECW-CO-R

Are climatic / hydrologic conditions on the site typical for this time of year?		Yes	<u>X</u>	No	<u> </u>	(If no, explain in Remarks.)
Are Vegetation	<u>no</u>	, Soil	<u>no</u>	, or Hydrology	<u>no</u>	significantly disturbed?
		Are "Normal Circumstances" present?	Yes	<u>X</u>	No	<u> </u>
Are Vegetation	<u>no</u>	, Soil	<u>no</u>	, or Hydrology	<u>no</u>	naturally problematic?
		(If needed, explain any answers in Remarks.)				

Hydrophytic Vegetation Present?	Yes	<u>X</u>	No		Is the Sampled Area			
Hydric Soil Present?	Yes	<u> </u>	No	<u>X</u>	within a Wetland?	Yes	<u> </u>	No <u>X</u>
Wetland Hydrology Present?	Yes	<u> </u>	No	<u>X</u>				

Remarks:

Tree Stratum		(Plot size: <u>30</u>)		Absolute % Cover	Dominant Species?	Indicator Status
1.						
2.						
3.						
4.						
				<u>0</u>	=Total Cover	
Sapling/Shrub Stratum		(Plot size: <u>30</u>)				
1.						
2.						
3.						
4.						
5.						
				<u>0</u>	=Total Cover	
Herb Stratum		(Plot size: <u>5</u>)				
1.	<u>Lactuca serriola</u>	<u>1</u>	<u>no</u>	<u>FACU</u>		
2.	<u>Erigeron bonariensis</u>	<u>2</u>	<u>no</u>	<u>FACU</u>		
3.	<u>Lolium perenne</u>	<u>5</u>	<u>yes</u>	<u>FAC</u>		
4.	<u>Erodium cicutarium</u>	<u>1</u>	<u>no</u>	<u>UPL</u>		
5.						
6.						
7.						
8.						
				<u>9</u>	=Total Cover	
Woody Vine Stratum		(Plot size: <u>30</u>)				
1.						
2.						
				<u>0</u>	=Total Cover	

% Bare Ground in Herb Stratum 	<u>91</u>	% Cover of Biotic Crust 	
---	-----------	---	--

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species <u>0</u>	x 1 =	<u>0</u>
FACW species <u>0</u>	x 2 =	<u>0</u>
FAC species <u>5</u>	x 3 =	<u>15</u>
FACU species <u>3</u>	x 4 =	<u>12</u>
UPL species <u>1</u>	x 5 =	<u>5</u>
Column Totals: <u>9</u> (A)		<u>32</u> (B)
Prevalence Index = B/A =		<u>3.56</u>

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0¹

☐ Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present?

Yes ☒	No ☐	
---	-----------------------------	--

Remarks:

SOIL

Sampling Point:

DP6

Profile Description (Describe to the depth needed to document the absence of the indicator.)									
Depth	Matrix		Redox Features				Texture	Remarks	
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-14	5YR 3/2	100					Sandy loam	Tilled soils	
-									
-									
-									
-									
-									
-									
-									
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.							² Location: PL=Pore Lining, M=Matrix.		
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)							Indicators for Problematic Hydric Soils³:		
☐ Histosol (A1)			☐ Sandy Gleyed Matrix (S4)			☐ 1 cm Muck (A9) (LRR C)			
☐ Histic Epipedon (A2)			☐ Sandy Redox (S5)			☐ 2 cm Muck (A10) (LRR B)			
☐ Black Histic (A3)			☐ Stripped Matrix (S6)			☐ Iron-Manganese Masses (F12) (LRR D)			
☐ Hydrogen Sulfide (A4)			☐ Loamy Mucky Mineral (F1)			☐ Reduced Vertic (F18)			
☐ Stratified Layers (A5) (LRR C)			☐ Loamy Gleyed Matrix (F2)			☐ Red Parent Material (F21)			
☐ 1 cm Muck (A9) (LRR D)			☐ Depleted Matrix (F3)			☐ Very Shallow Dark Surface (F22)			
☐ Depleted Below Dark Surface (A11)			☐ Redox Dark Surface (F6)			☐ Other (Explain in Remarks)			
☐ Thick Dark Surface (A12)			☐ Depleted Dark Surface (F7)			³ Indicators of hydrophytic vegetation and			
☐ Iron Monosulfide (A18)			☐ Redox Depressions (F8)			wetland hydrology must be present,			
☐ Sandy Mucky Mineral (S1)						unless disturbed or problematic.			
Restrictive Layer (if observed):									
Type: _____									
Depth (inches): _____							Hydric Soil Present? Yes No X		
Remarks:									
HYDROLOGY									
Wetland Hydrology Indicators:									
Primary Indicators (minimum of one is required; check all that apply)					Secondary Indicators (2 or more required)				
☐ Surface Water (A1)			☐ Salt Crust (B11)			☐ Water Marks (B1) ((Riverine))			
☐ High Water Table (A2)			☐ Biotic Crust (B12)			☐ Sediment Deposits (B2) ((Riverine))			
☐ Saturation (A3)			☐ Aquatic Invertebrates (B13)			☐ Drift Deposits (B3) ((Riverine))			
☐ Water Marks (B1) ((Nonriverine))			☐ Hydrogen Sulfide Odor (C1)			☐ Drainage Patterns (B10)			
☐ Sediment Deposits (B2) ((Nonriverine))			☐ Oxidized Rhizospheres on Living Roots (C3)			☐ Dry-Season Water Table (C2)			
☐ Drift Deposits (B3) ((Nonriverine))			☐ Presence of Reduced Iron (C4)			☐ Crayfish Burrows (C8)			
☐ Surface Soil Cracks (B6)			☐ Recent Iron Reduction in Tilled Soils (C6)			☐ Saturation Visible on Aerial Imagery (C9)			
☐ Inundation Visible on Aerial Imagery (B7)			☐ Stunted or Stressed Plants (D1) (LRR A)			☐ Shallow Aquitard (D3)			
☐ Water-Stained Leaves (B9) (except)			☐ Other (Explain in Remarks)			☐ FAC-Neutral Test (D5)			
Field Observations:									
Surface Water Present?	Yes	☐	No	☒	Depth (inches):	☐	Wetland Hydrology Present? Yes ☐ No ☐ X		
Water Table Present?	Yes	☐	No	☒	Depth (inches):	☐			
Saturation Present?	Yes	☐	No	☒	Depth (inches):	☐			
(includes capillary fringe)									
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:									
Remarks:									

U.S. Army Corps of Engineers (USACE)
**RAPID ORDINARY HIGH WATER MARK
(OHWM) FIELD IDENTIFICATION DATA SHEET**
The proponent agency is Headquarters USACE CECW-COR.

Form Approved -
OMB No. 0710-0024
Expires: 2027-09-30

The Agency Disclosure Notice (ADN)

The Public reporting burden for this collection of information, 0710-0024, is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

Project ID #: Mustang Creek (T6-1) Site Name: Fair Turlock Subbasin GSA Pinellas Date and Time: 11/5/24 12:05 PM

Location (lat/long):

Investigator(s): AJ Samra, Ariana (Cowan)

Step 1 Site overview from remote and online resources.

Check boxes for online resources used to evaluate site:

- | | | |
|---|---|--|
| ☐ gage data | ☐ LiDAR | ☐ geologic maps |
| ☐ climatic data | ☒ satellite imagery | ☐ land use maps |
| ☒ aerial photos | ☐ topographic maps | ☐ Other: |

Describe land use and flow conditions from online resources.

Were there any recent extreme events (floods or drought)?

Intermittent stream feature that delivers flow to adjacent agricultural fields, artificially altered

Step 2 Site conditions during field assessment. First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or human-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls, etc.

Established bed, bank, and channel, existing infrastructure present such as a concrete culvert at downstream end adjacent to E Monte Vista Ave. Pipes present throughout feature length.

Step 3 Mark the boxes next to the indicators used to help identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators used to identify the location of the OHWM may be just below or above the OHWM.

Make a slash in boxes next to indicators that are helpful in identifying the OHWM. After the initial assessment, those indicators identified at the OHWM elevation should be changed from slashes to x's. Note, it is not necessary to mark indicators that are present but do not help inform identification of the OHWM.

Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and attach a photo log.

Geomorphic indicators

- | | |
|--|---|
| ☒ Break in slope | ☐ Channel bar |
| ☒ on the bank | ☐ shelving (berms) on bar |
| ☐ undercut bank | ☐ unvegetated |
| ☐ valley bottom | ☐ vegetation transition (go to veg. indicators) |
| ☐ Other: | ☐ sediment transition (go to sed. indicators) |
| ☒ Shelving | ☐ upper limit of deposition on bar |
| ☒ shelf at top of bank | ☐ Instream bedforms and other bedload transport evidence |
| ☐ natural levee | ☐ deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.) |
| ☐ human-made berms or levees | ☐ bedforms (e.g., pools, riffles, steps, etc.) |
| ☐ other berms: | ☐ Weathered clasts or bedrock |
| ☐ Secondary channels | ☐ erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.) |

Sediment indicators

- | |
|--|
| ☐ Soil development |
| ☐ Changes in character of soil |
| ☐ Mudcracks |
| ☐ Changes in particle-size distribution |
| ☐ transition from _____ to _____ |
| ☐ upper limit of sand-sized particles |
| ☐ silt deposits |

Vegetation indicators (Consider the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain)

- | | |
|---|---|
| ☒ Change in vegetation type from <u>herbaceous</u> to <u>annual grasses</u> | ☐ Sediment deposited on vegetation or structures |
| ☒ Change in density of vegetation | ☒ Wracking/presence of organic litter |
| ☐ Exposed roots below intact soil layer | ☒ Presence of large wood |
| ☐ Other vegetation observations | ☐ Leaf litter disturbed or washed away |
| | ☐ Water staining |

Other physical indicators

Other observed indicators? Describe:

Project ID #: Mustang Creek (IC-1)

Step 4 Was additional information used to support identification of the OHWM? ☐ Yes ☒ No

If yes, describe and attach information to data sheet:

Step 5 Is an OHWM present at this site? ☒ Yes ☐ No

Describe rationale for location of OHWM or lack thereof by describing any observed indicators (at, above, and/or below the OH-IWM location).

Changes in vegetation type and density from low amounts of herbaceous vegetation to high amounts of annual grasses; break in slope on top of bank, along with shelving; vegetation matted down where flows occurred; and abundance of wrack, debris & organic litter.

Additional observations or notes

Channel flow is redirected via piping to surrounding agricultural fields

Attach an imagery log of the site.

Imagery log attached? ☒ Yes ☐ No If no, explain why not:

List photographs, or other imagery/sketches, and include descriptions in the table below.

Number photographs in the order that they are taken. Attach imagery and include annotations of features.

[illegible]

Appendix D

Representative Photographs



Photo 1: DP1, freshwater emergent wetland facing east.



Photo 2: Freshwater emergent wetland on the western side of Hawkins Rd facing west.



Photo 3: Freshwater emergent wetland on the eastern side of Hawkins Rd facing west.



Photo 4: Upland and Freshwater emergent wetland on the western side of Hawkins Rd facing north.



Photo 5: DP2, upland photo facing northwest.



Photo 6: DP3, upland photo facing north.



Photo 7: DP3, upland photo facing west.



Photo 8: Upland facing east.



Photo 9: DP4, upland facing southwest.



Photo 10: DP4, upland facing west.



Photo 11: Dp4, upland facing east.



Photo 12: Representative photo of a culvert at DP4 facing southeast.



Photo 13: Pond P-1 facing northeast.



Photo 14: Turlock Irrigation District Main Canal AW-1, representative photo northeast.



Photo 15: Freshwater emergent wetland FEW-5 and FEW-6 representative photo facing north.



Photo 16: Representative photo of a culvert south of playa pool PP-1 facing east.



Photo 17: Ephemeral ditch ED-3 facing northwest.



Photo 18: Ephemeral ditch ED-4 facing south.



Photo 19: Ephemeral ditch ED-6 facing west.



Photo 20: Location of proposed Sand Creek Culvert #1, facing east.



Photo 21: Location of proposed Sand Creek Culvert #2, facing south.



Photo 22: Agricultural field adjacent to proposed Sand Creek Culvert #2 location, facing east.



Photo 23: Proposed regulating basin off E Keyes Road, actively maintained by landowner. Facing south.



Photo 24: Proposed regulating basin off E Keyes Road, actively maintained by landowner. Facing north.



Photo 25: Mustang Creek (MC-1) Culvert, adjacent to E Monte Vista Ave. Facing east.



Photo 26: MC-1, facing south.



Photo 27: MC-1, facing south.



Photo 28: MC-1, facing south.



Photo 29: MC-1 connecting with Mustang Lake, facing south.



Photo 30: MC-1 connecting with Mustang Lake, facing north.



Photo 31: DP5 at proposed Sand Creek Culvert #1, facing east.



Photo 32: DP6 at reservoir basin, facing north.

Appendix E

**ORM Aquatic Resources
Spreadsheet**

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway
C-1	CALIFORNIA	R4	RIVERINE	Area	0.102921	ACRE	A3.TRIB-404	37.61722600	-120.64443500	tuolumne river
ED-1	CALIFORNIA	R6	SLOPE	Area	0.000524	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.54170600	-120.62732200	tuolumne river
ED-2	CALIFORNIA	R6	SLOPE	Area	0.005198	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.54158500	-120.62743400	tuolumne river
ED-3	CALIFORNIA	R6	SLOPE	Area	0.022294	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.53647800	-120.62751000	tuolumne river
ED-4	CALIFORNIA	R6	SLOPE	Area	0.072354	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.53593300	-120.62749100	tuolumne river
ED-5	CALIFORNIA	R6	SLOPE	Area	0.00237	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.52147600	-120.62780500	tuolumne river
ED-6	CALIFORNIA	R6	SLOPE	Area	0.01455	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.52148300	-120.62804900	tuolumne river
ED-7	CALIFORNIA	PEM	SLOPE	Area	0.004316	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.52065900	-120.62936800	tuolumne river
FEW-1	CALIFORNIA	PEM	DEPRESS	Area	0.029581	ACRE	NON-WOTUS-WET.NEGATIVE.A4	37.61000700	-120.64578000	tuolumne river
FEW-2	CALIFORNIA	PEM	DEPRESS	Area	0.035212	ACRE	NON-WOTUS-WET.NEGATIVE.A4	37.60998100	-120.64552000	tuolumne river
FEW-3	CALIFORNIA	PEM	DEPRESS	Area	0.072335	ACRE	NON-WOTUS-WET.NEGATIVE.A4	37.59639000	-120.64577100	tuolumne river
FEW-4	CALIFORNIA	PEM	DEPRESS	Area	0.093067	ACRE	NON-WOTUS-WET.NEGATIVE.A4	37.59627700	-120.64553500	tuolumne river
FEW-5	CALIFORNIA	PEM	DEPRESS	Area	0.095758	ACRE	NON-WOTUS-WET.NEGATIVE.A4	37.59469000	-120.64262700	tuolumne river
FEW-6	CALIFORNIA	PEM	DEPRESS	Area	0.050059	ACRE	NON-WOTUS-WET.NEGATIVE.A4	37.59469200	-120.63935600	tuolumne river
P-1	CALIFORNIA	R6	DEPRESS	Area	0.042149	ACRE	B4-EXCL-ART.IRR	37.61697800	-120.64447500	tuolumne river
PP-1	CALIFORNIA	R6	DEPRESS	Area	0.078789	ACRE	NON-WOTUS-WET.NEGATIVE.A4	37.59416800	-120.62725100	tuolumne river

Appendix F

Aquatic Resources Figures



Coordinate System: NAD 1983 State Plane
California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

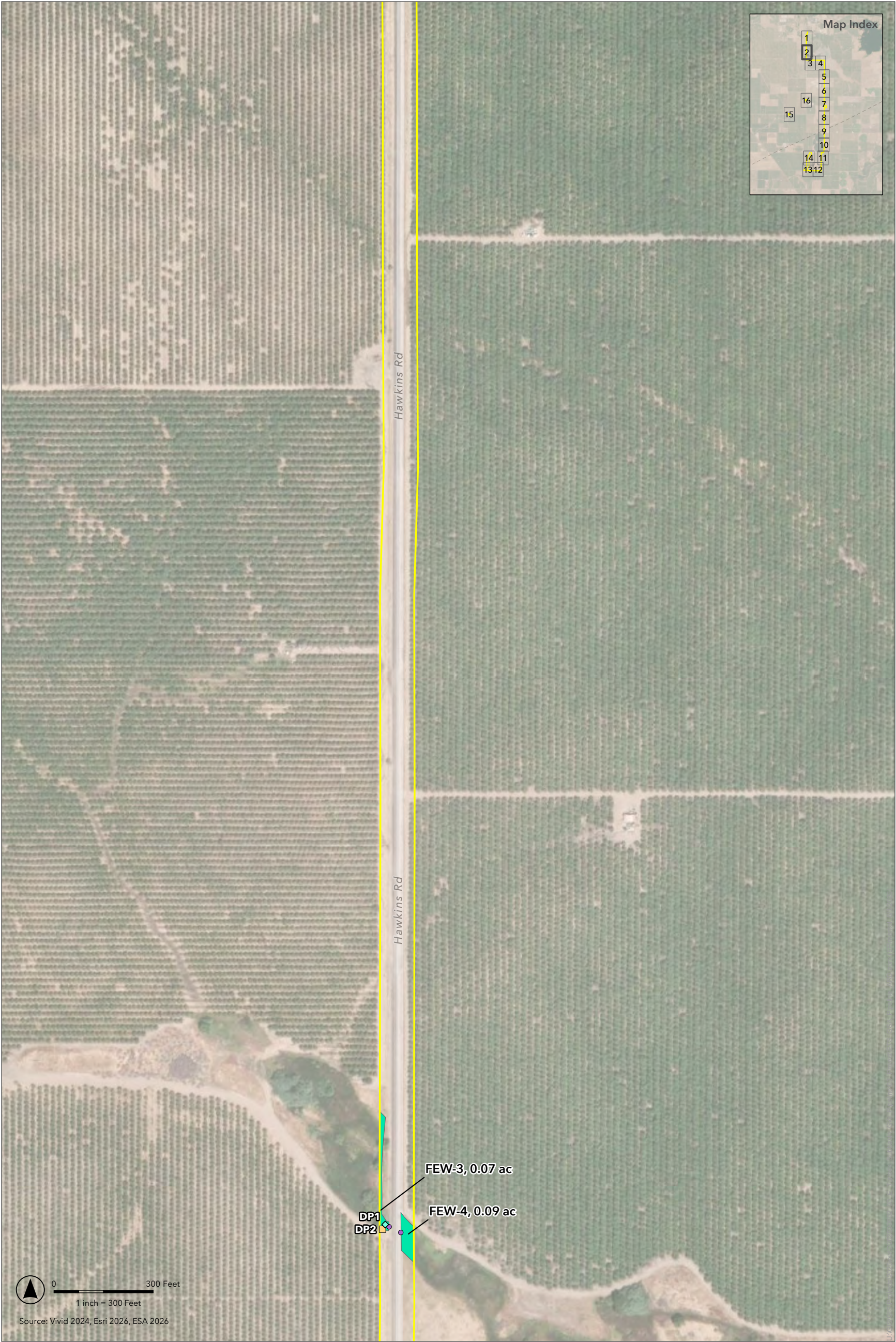
Figure 5a
Delineated Aquatic Resources
Page 1 of 16

- Survey Area (223.90 acres)
- ⊕ Map Reference Point
- Culvert
- Sample Points**
 - Upland
 - ◆ Wetland

- Wetlands (0.38 acre)**
 - Freshwater Emergent Wetland (0.38 acre)
- Other Waters (2.41 acres)**
 - Turlock Irrigation District Main Canal (0.10 acre)
 - Ephemeral Ditch (0.12 acre)
 - Intermittent Channel (0.58 acre)
 - Pond (1.53 acres)
 - Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra
Mapping by: Eryn Pimentel
Created on: 5/28/2026





Coordinate System: NAD 1983 State Plane
California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

Figure 5b
Delineated Aquatic Resources
Page 2 of 16

- Survey Area (223.90 acres)
- ⊕ Map Reference Point
- Culvert
- Sample Points**
 - Upland
 - ◆ Wetland

- Wetlands (0.38 acre)**
 - Freshwater Emergent Wetland (0.38 acre)
- Other Waters (2.41 acres)**
 - Turlock Irrigation District Main Canal (0.10 acre)
 - Ephemeral Ditch (0.12 acre)
 - IntermittentChannel (0.58 acre)
 - Pond (1.53 acres)
 - Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra
Mapping by: Eryn Pimentel
Created on: 5/28/2026





Coordinate System: NAD 1983 State Plane
California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

Figure 5c
Delineated Aquatic Resources
Page 3 of 16

- Survey Area (223.90 acres)
- ⊕ Map Reference Point
- Culvert
- Sample Points**
 - ◻ Upland
 - ◻ Wetland

- Wetlands (0.38 acre)**
 - ◻ Freshwater Emergent Wetland (0.38 acre)
- Other Waters (2.41 acres)**
 - ◻ Turlock Irrigation District Main Canal (0.10 acre)
 - ◻ Ephemeral Ditch (0.12 acre)
 - ◻ IntermittentChannel (0.58 acre)
 - ◻ Pond (1.53 acres)
 - ◻ Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra
Mapping by: Eryn Pimentel
Created on: 5/28/2026





Coordinate System: NAD 1983 State Plane
California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

Figure 5d
Delineated Aquatic Resources
Page 4 of 16

- Survey Area (223.90 acres)
- Map Reference Point
- Culvert
- Sample Points**
 - Upland
 - Wetland

- Wetlands (0.38 acre)**
 - Freshwater Emergent Wetland (0.38 acre)
- Other Waters (2.41 acres)**
 - Turlock Irrigation District Main Canal (0.10 acre)
 - Ephemeral Ditch (0.12 acre)
 - IntermittentChannel (0.58 acre)
 - Pond (1.53 acres)
 - Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra
Mapping by: Eryn Pimentel
Created on: 5/28/2026





Coordinate System: NAD 1983 State Plane
California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

Figure 5e
Delineated Aquatic Resources
Page 5 of 16

- Survey Area (223.90 acres)
- Map Reference Point
- Culvert
- Sample Points**
 - Upland
 - Wetland

- Wetlands (0.38 acre)**
 - Freshwater Emergent Wetland (0.38 acre)
- Other Waters (2.41 acres)**
 - Turlock Irrigation District Main Canal (0.10 acre)
 - Ephemeral Ditch (0.12 acre)
 - IntermittentChannel (0.58 acre)
 - Pond (1.53 acres)
 - Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra
Mapping by: Eryn Pimentel
Created on: 5/28/2026





Coordinate System: NAD 1983 State Plane
California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

Figure 5f
Delineated Aquatic Resources

Page 6 of 16

Survey Area (223.90 acres)

Map Reference Point

Culvert

Sample Points

Upland

Wetland

Wetlands (0.38 acre)

Freshwater Emergent Wetland (0.38 acre)

Other Waters (2.41 acres)

Turlock Irrigation District Main Canal (0.10 acre)

Ephemeral Ditch (0.12 acre)

IntermittentChannel (0.58 acre)

Pond (1.53 acres)

Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra
Mapping by: Eryn Pimentel
Created on: 5/28/2026



Coordinate System: NAD 1983 State Plane
California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

Figure 5g
Delineated Aquatic Resources
Page 7 of 16

- Survey Area (223.90 acres)
- Map Reference Point
- Culvert
- Sample Points**
 - Upland
 - Wetland

- Wetlands (0.38 acre)**
 - Freshwater Emergent Wetland (0.38 acre)
- Other Waters (2.41 acres)**
 - Turlock Irrigation District Main Canal (0.10 acre)
 - Ephemeral Ditch (0.12 acre)
 - IntermittentChannel (0.58 acre)
 - Pond (1.53 acres)
 - Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra
Mapping by: Eryn Pimentel
Created on: 5/28/2026





Coordinate System: NAD 1983 State Plane
California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

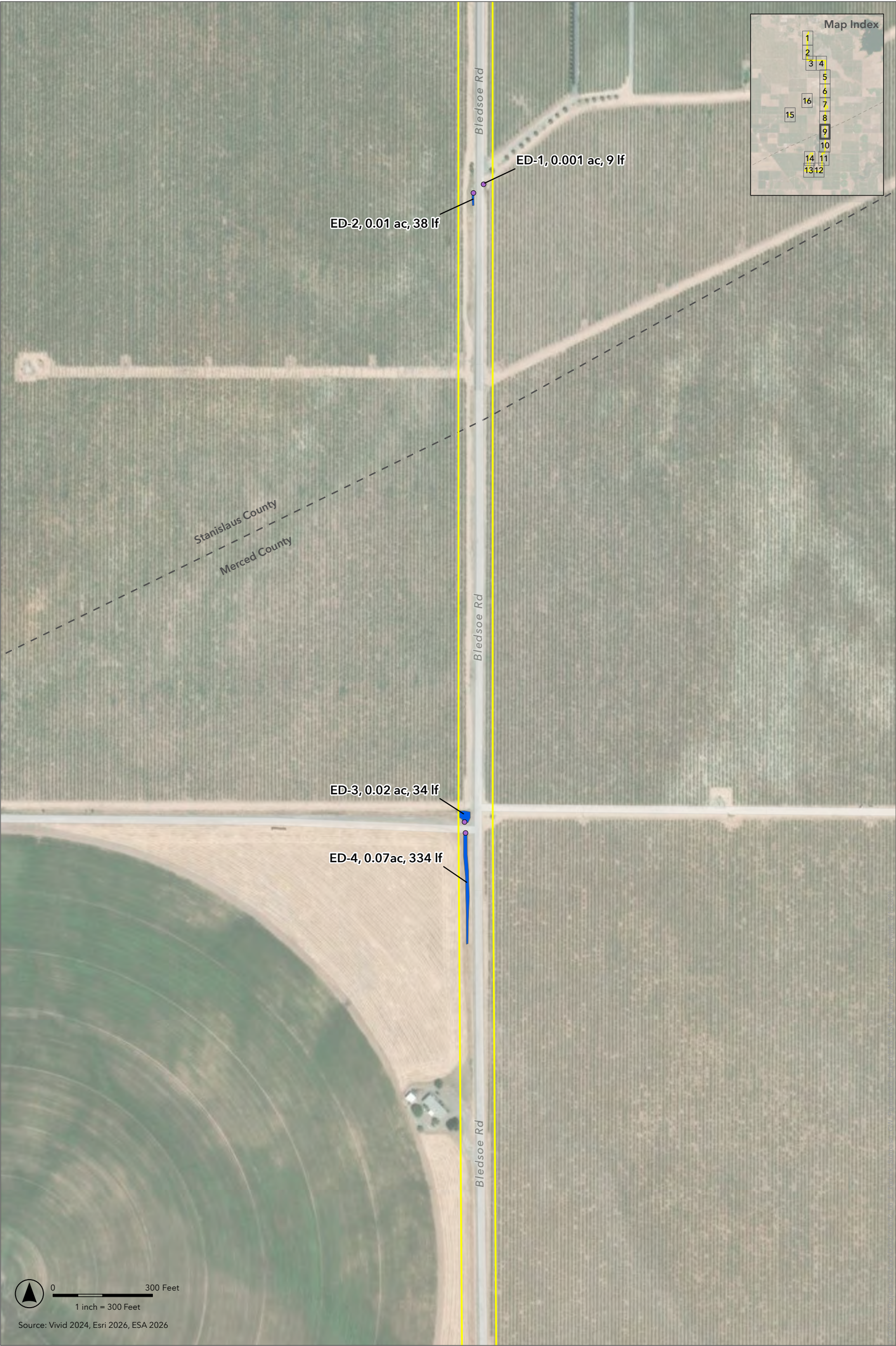
Figure 5h
Delineated Aquatic Resources
Page 8 of 16

- Survey Area (223.90 acres)
- Map Reference Point
- Culvert
- Sample Points**
 - Upland
 - Wetland

- Wetlands (0.38 acre)**
 - Freshwater Emergent Wetland (0.38 acre)
- Other Waters (2.41 acres)**
 - Turlock Irrigation District Main Canal (0.10 acre)
 - Ephemeral Ditch (0.12 acre)
 - IntermittentChannel (0.58 acre)
 - Pond (1.53 acres)
 - Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra
Mapping by: Eryn Pimentel
Created on: 5/28/2026





Coordinate System: NAD 1983 State Plane
California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

Figure 5i
Delineated Aquatic Resources

Page 9 of 16

Survey Area (223.90 acres)

Map Reference Point

Culvert

Sample Points

Upland

Wetland

Wetlands (0.38 acre)

Freshwater Emergent Wetland (0.38 acre)

Other Waters (2.41 acres)

Turlock Irrigation District Main Canal (0.10 acre)

Ephemeral Ditch (0.12 acre)

Intermittent Channel (0.58 acre)

Pond (1.53 acres)

Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra
Mapping by: Eryn Pimentel
Created on: 5/28/2026



Coordinate System: NAD 1983 State Plane California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

Figure 5j
Delineated Aquatic Resources

Page 10 of 16

Survey Area (223.90 acres)

Map Reference Point

Culvert

Sample Points

Upland

Wetland

Wetlands (0.38 acre)

Freshwater Emergent Wetland (0.38 acre)

Other Waters (2.41 acres)

Turlock Irrigation District Main Canal (0.10 acre)

Ephemeral Ditch (0.12 acre)

IntermittentChannel (0.58 acre)

Pond (1.53 acres)

Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra

Mapping by: Eryn Pimentel

Created on: 5/28/2026



Coordinate System: NAD 1983 State Plane
California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

Figure 5k
Delineated Aquatic Resources
Page 11 of 16

Survey Area (223.90 acres)

Map Reference Point

Culvert

Sample Points

Upland

Wetland

Wetlands (0.38 acre)

Freshwater Emergent Wetland (0.38 acre)

Other Waters (2.41 acres)

Turlock Irrigation District Main Canal (0.10 acre)

Ephemeral Ditch (0.12 acre)

IntermittentChannel (0.58 acre)

Pond (1.53 acres)

Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra
Mapping by: Eryn Pimentel
Created on: 5/28/2026





Coordinate System: NAD 1983 State Plane
California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

Figure 5I
Delineated Aquatic Resources
Page 12 of 16

- Survey Area (223.90 acres)
- Map Reference Point
- Culvert
- Sample Points**
 - Upland
 - Wetland

- Wetlands (0.38 acre)**
 - Freshwater Emergent Wetland (0.38 acre)
- Other Waters (2.41 acres)**
 - Turlock Irrigation District Main Canal (0.10 acre)
 - Ephemeral Ditch (0.12 acre)
 - IntermittentChannel (0.58 acre)
 - Pond (1.53 acres)
 - Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra
Mapping by: Eryn Pimentel
Created on: 5/28/2026





Coordinate System: NAD 1983 State Plane
California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

Figure 5m
Delineated Aquatic Resources
Page 13 of 16

- Survey Area (223.90 acres)
- Map Reference Point
- Culvert
- Sample Points**
 - Upland
 - Wetland

- Wetlands (0.38 acre)**
 - Freshwater Emergent Wetland (0.38 acre)
- Other Waters (2.41 acres)**
 - Turlock Irrigation District Main Canal (0.10 acre)
 - Ephemeral Ditch (0.12 acre)
 - IntermittentChannel (0.58 acre)
 - Pond (1.53 acres)
 - Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra
Mapping by: Eryn Pimentel
Created on: 5/28/2026





Coordinate System: NAD 1983 State Plane
California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

Figure 5n
Delineated Aquatic Resources
Page 14 of 16

- Survey Area (223.90 acres)
- ⊕ Map Reference Point
- Culvert
- Sample Points**
 - Upland
 - ◆ Wetland

- Wetlands (0.38 acre)**
 - Freshwater Emergent Wetland (0.38 acre)
- Other Waters (2.41 acres)**
 - Turlock Irrigation District Main Canal (0.10 acre)
 - Ephemeral Ditch (0.12 acre)
 - IntermittentChannel (0.58 acre)
 - Pond (1.53 acres)
 - Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra
Mapping by: Eryn Pimentel
Created on: 5/28/2026





Coordinate System: NAD 1983 State Plane
California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

Figure 5o
Delineated Aquatic Resources
Page 15 of 16

- Survey Area (223.90 acres)
- ⊕ Map Reference Point
- Culvert
- Sample Points**
 - Upland
 - ◆ Wetland

- Wetlands (0.38 acre)**
 - Freshwater Emergent Wetland (0.38 acre)
- Other Waters (2.41 acres)**
 - Turlock Irrigation District Main Canal (0.10 acre)
 - Ephemeral Ditch (0.12 acre)
 - IntermittentChannel (0.58 acre)
 - Pond (1.53 acres)
 - Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra
Mapping by: Eryn Pimentel
Created on: 5/28/2026





Coordinate System: NAD 1983 State Plane
California Zone III FIPS 0404 (US Feet)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: N/A

Figure 5p
Delineated Aquatic Resources
Page 16 of 16

- Survey Area (223.90 acres)
- Map Reference Point
- Culvert
- Sample Points**
 - Upland
 - Wetland

- Wetlands (0.38 acre)**
 - Freshwater Emergent Wetland (0.38 acre)
- Other Waters (2.41 acres)**
 - Turlock Irrigation District Main Canal (0.10 acre)
 - Ephemeral Ditch (0.12 acre)
 - IntermittentChannel (0.58 acre)
 - Pond (1.53 acres)
 - Playa Pool (0.08 acre)

by: Angelica Oregel and AJ Samra
Mapping by: Eryn Pimentel
Created on: 5/28/2026

