



SHALLOW WELL DRILLING AND WATER CONSERVATION PROJECT

DRAFT INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

AUGUST 2024

PREPARED FOR:

Turner Island Water District
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ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
AF	acre-feet
APE	Area of Potential Effect
APN	Assessor's Parcel Number
ARA	Aggregate Resources Areas
ASM	ASM Affiliates
BMP	Best Management Practices
BPS	best performance standards
CalEEMod	California Emissions Estimator Modeling (software)
CalFire	California Department of Forestry and Fire Protection
CARB	California Air Resources Board
CBC	California Building Code
CCAA	California Clean Air Act
CCIC	Central California Information Center
CDFW	California Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFS	cubic feet per second
CGP	Construction General Permit
CGS	California Geological Survey
CH ₄	Methane
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	Carbone Monoxide
CO ₂	Carbon dioxide
County	Merced County
CWA	Clean Water Act
dBA	A-weighted decibels
District	Turner Island Water District
DTSC	Department of Toxic Substances Control
DWR	(California) Department of Water Resources

EIR	Environmental Impact Report
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FMMP	Farmland Mapping and Monitoring Program
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
GHG	Greenhouse Gas
GIS	Geographic Information System
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
GWP	Global Warming Potential
HMRD	Henry Miller Reclamation District
HUC	Hydrologic Unit Code
I-5	Interstate 5
IS	Initial Study
IS/MND	Initial Study/Mitigated Negative Declaration
km	kilometers
MBTA	Migratory Bird Act
MMRP	Mitigation Monitoring and Reporting Program
MND	Mitigated Negative Declaration
MTCO ₂ e	Metric Tons of Carbon Dioxide Equivalent
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
ND	Negative Declaration
NEPA	National Environmental Policy Act
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
NPDES	National Pollution Discharge Elimination System
NRHP	National Register of Historic Places
O ₃	Ozone
Pb	Lead
PG&E	Pacific Gas & Electric
PM ₁₀	particulate matter 10 microns in size
PM _{2.5}	particulate matter 2.5 microns in size

ppb	parts per billion
ppm	parts per million
Project	Turner Island Water District Shallow Well and Water Conservation Project
ROG	Reactive Organic Gases
RWQCB	Regional Water Quality Control Board
SCAQMD	South Coast Air Quality Management District
SGMA	Sustainable Groundwater Management Act
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO ₂	Sulfur Dioxide
SR	State Route
SRA	State Responsibility Area
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminants
TPY	tons per year
USACE	United States Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
µg/m ³	micrograms per cubic meter
WDR	Waste Discharge Requirements
YBP	years before present

CHAPTER 1 INTRODUCTION

Provost & Pritchard Consulting Group (Provost & Pritchard) has prepared this Initial Study/Mitigated Negative Declaration (IS/MND) on behalf of Turner Island Water District (District) to address the environmental effects of the Shallow Well Drilling and Water Conservation Project (Project). This document has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq. The District is the CEQA lead agency for this Project.

The site and the Project are described in detail in [Chapter 2 Project Description](#).

1.1 REGULATORY INFORMATION

An Initial Study (IS) is a document prepared by a lead agency to determine whether a project may have a significant effect on the environment. In accordance with California Code of Regulations Title 14 (Chapter 3, Section 15000, *et seq.*)-- also known as the CEQA Guidelines--Section 15064 (a)(1) states that an environmental impact report (EIR) must be prepared if there is substantial evidence in light of the whole record that the Project under review may have a significant effect on the environment and should be further analyzed to determine mitigation measures or project alternatives that might avoid or reduce project impacts to less than significant levels. A negative declaration (ND) may be prepared instead if the lead agency finds that there is no substantial evidence in light of the whole record that the project may have a significant effect on the environment. An ND is a written statement describing the reasons why a proposed Project, not otherwise exempt from CEQA, would not have a significant effect on the environment and, therefore, why it would not require the preparation of an EIR (CEQA Guidelines Section 15371). According to CEQA Guidelines Section 15070, a ND or *mitigated* ND shall be prepared for a project subject to CEQA when either:

- a. The IS shows there is no substantial evidence, in light of the whole record before the agency, that the proposed Project may have a significant effect on the environment, or
- b. The IS identified potentially significant effects, but:
 1. Revisions in the project plans or proposals made by or agreed to by the applicant before the proposed MND and IS is released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur is prepared, and
 2. There is no substantial evidence, in light of the whole record before the agency, that the proposed Project as *revised* may have a significant effect on the environment.

1.2 DOCUMENT FORMAT

This IS/MND contains six chapters. [Chapter 1 Introduction](#), provides an overview of the Project and the CEQA process. [Chapter 2 Project Description](#), provides a detailed description of proposed Project components and objectives. [Chapter 3 Determination](#), the Lead Agency's determination based upon this initial evaluation. [Chapter 4 Environmental Impact Analysis](#) presents the CEQA checklist and environmental analysis for all impact areas, mandatory findings of significance, and feasible mitigation measures. If the Project does not have the potential to significantly impact a given issue area, the relevant section provides a brief discussion of the reasons why no impacts are expected. If the Project could have a potentially significant impact on a resource, the issue area discussion provides a description of potential impacts, and appropriate mitigation measures and/or permit requirements that would reduce those impacts to a less than significant level. [Chapter 5 Mitigation, Monitoring, and Reporting Program](#) (MMRP), provides the

proposed mitigation measures, implementation timelines, and the entity/agency responsible for ensuring implementation. **Chapter 6 References** details the documents and reports this document relies upon to provide its analysis.

The Air Quality and Greenhouse California Emissions Estimator Modeling (software) (CalEEMod) Output Files, Biological Resources Evaluation, and Phase I Survey/Class III Inventory, are provided as technical **Appendix A, Appendix B, and Appendix C**, respectively, at the end of this document.

CHAPTER 2 PROJECT DESCRIPTION

2.1 PROJECT BACKGROUND

2.1.1 Project Title

Shallow Well Drilling and Water Conservation Project

2.1.2 Lead Agency Name and Address

Turner Island Water District
7543 North Ingram, Suite 102
Fresno, California 93711

2.1.3 Contact Person and Phone Number

Lead Agency Contact

Kel Mitchel
President
(818) 519-2027
kel@turnerislandwaterdistrict.com

CEQA Consultant

Provost & Pritchard Consulting Group
Amy Wilson, Environmental Project Manager
(559) 449-2700

2.1.4 Project Location

The proposed Project is located in Merced County, California, approximately 100 miles south-southeast of Sacramento and 150 miles north-northwest of Bakersfield. The Project area is located approximately 12 miles southwest of the City of Merced located within Merced County. The centroid of the Project site is 37° 10' 51.73" N, 120° 42' 44.84" W. (see [Figure 2-1](#) and [Figure 2-2](#)).

2.1.5 General Plan Designation and Zoning

Project Area	General Plan Designation	Zoning District
ONSITE	A - Agricultural	A-2 – Exclusive Agricultural
ADJACENT LANDS	A - Agricultural	A-2 – Exclusive Agricultural

2.1.6 Description of Project

Project Background and Purpose

The District provides irrigation water supplies to approximately 7,000 acres of land within its boundaries. The District utilizes Mariposa Slough as its main water conveyance channel. In addition, water supplies to the District come from a combination of well water, drainage water coming into the District via the Poso Drain from the Henry Miller Reclamation District (HMRD) and occasionally surface water from east of the San Joaquin River or flood water from the San Joaquin River. The District has a contract with HMRD that allows the District to utilize their excess drainage water. Mariposa Slough receives water from a section of the San Joaquin River and also from the Fresno River, Dry Creek, Berenda Slough, and the Chowchilla River. Downstream of the Project site, Mariposa Slough connects back to the San Joaquin River near the San Luis National Wildlife Refuge, and the San Joaquin River continues northwest to the San Joaquin-Sacramento River Delta, near Stockton.

District wells pump groundwater from below the Corcoran Clay causing concern of potential land surface subsidence. Subsidence is known to cause damage to water conveyance facilities resulting in inefficient and obstructed services. The District also sees high losses of water within its facilities. Several farm road crossings of Mariposa Slough have culverts lacking water control gates.

An existing water return system, consisting of a return pump at the end of a branch canal and pipeline returning water to the District's Eastside Canal and then back to Mariposa Slough currently has insufficient capacity to handle the wide variations of inflow coming from HMRD. When the wide variations of water inflow occur, pumps at the end of Mariposa Slough are used to pump water from the last reach of Mariposa Slough to the Mariposa Bypass to prevent last reaches of Mariposa Slough from overtopping. In addition, the last reach of Mariposa Slough has high seepage losses and deliveries to turnout pumps in the last reach result in very high loss rates.

The District has been awarded a grant from the California Department of Water Resources (DWR) through a cooperative agreement of the Groundwater Sustainability Agencies in the Merced Groundwater Subbasins to fund the Project.

Project Description

The shallow well drilling portion of the Project would involve the construction and operation of two new agricultural irrigation wells screened above the Corcoran Clay so that their use could reduce the District's reliance on the lower aquifer water. Well No. 1 would be located roughly at the midway point on the eastern edge of Assessor's Parcel Number (APN) 074-030-011 near the Eastside Canal. Well No. 2 would be located roughly at the southeastern corner of APN 065-050-004 near the Eastside Canal. The new wells would be drilled to a maximum depth of approximately 200 feet. Up to two existing wells that have been drilled and screened below the Corcoran Clay may be abandoned as part of the Project. Transitioning pumping from the deep aquifer below the Corcoran Clay to the shallow aquifer above the Corcoran Clay would reduce subsidence over the long term. A Variance application approved by Merced County would be required to allow the two new wells to be located at a distance closer to the existing deep wells and a surface waterway than would normally be permitted (300 and 100 feet, respectively).

The water conservation portion of the Project would involve the modification of three existing weirs along the Mariposa Slough, and construction of two recharge basins adjacent to the Mariposa Slough. The weirs would be equipped with automated canal gates and flow measurement devices. Additionally, the existing pumps at each weir would be replaced with new pumps and would be sized with a capacity of up to 35

cubic feet per second (CFS). The new pumps which would return water to the head of the District's system and avoid or reduce losses in the last reach of Mariposa Slough. One recharge basin would be approximately 30 acres and would have the capacity to store up to 150 acre-feet (AF) of water. The second recharge basin would be approximately 23 acres and would have the capacity to store up to 115 AF of water. Both recharge basins would be constructed with levees that would be built up to a maximum height of six feet tall and would be comprised of excavation material from the proposed basin construction. No excavation material would be exported as it would be balanced onsite. Water would be diverted to each recharge basin via proposed pumps connecting to the Mariposa Slough. Each pump would have a conveyance capacity of up to 70 CFS. The proposed Project would allow the District to store surface water when available and delay the pumping of lower aquifer wells, thereby reducing strain on the groundwater resources from which these wells draw.

Construction Schedule

Construction is anticipated to begin April 2025 and conclude December 2025. Construction would take place Monday through Friday from the hours of 7:00 a.m. to 6:00 p.m.

Construction Equipment and Procedure

Construction equipment would likely include excavators, backhoes, graders, forklifts, skid steers, loaders, hauling trucks and trailers, drilling rig, water truck, a generator, and a motor. Drilling fluid and additives would also be required. Water would be supplied to the site by a nearby well. A portable restroom would be located onsite for construction personnel. Access to the site would be provided by existing paved roads including Sandy Mush Road, Nickel Road, and Sand Slough Road. Agricultural dirt roads would be used to access the well sites and the staging area, depending on weather. Post-construction activities would include system testing, commissioning, and site clean-up. Construction would require temporary staging and storage of materials and equipment. The Project staging area would be located onsite and would be approximately 200 x 200 feet.

The total Project area would be 99 acres. The total area surveyed for the Biological Resources Evaluation and the Phase I/Class III inventory Cultural Resources report covered 180 acres.

Operation and Maintenance

The operation and maintenance of the Project would be consistent with that of the District's other similar facilities and with what presently takes place at the site. Groundwater conditions would be monitored to minimize negative impacts on the surrounding areas (such as nearby wells and crops). The District currently monitors and collects groundwater elevation data from all existing wells within its boundary monthly. It also collects EC data from the wells at various points in time to maintain viable delivered water quality at the field level.

2.1.7 Site and Surrounding Land Uses and Setting

Table 2-1: Existing Uses, General Plan Designation, & Zone Districts of Surrounding Properties

Direction from Project Site	Existing Use	General Plan Designation	Zone District
NORTH	Agricultural	A – Agricultural	A-2 – Exclusive Agricultural
EAST	Agricultural	A – Agricultural	A-2 – Exclusive Agricultural
SOUTH	Agricultural	A – Agricultural	A-2 – Exclusive Agricultural
WEST	Agricultural	A – Agricultural	A-2 – Exclusive Agricultural

2.1.8 Other Public Agencies Whose Approval May Be Required

- California Department of Water Resources
- State Water Resources Control Board
- Merced County (Variance)

2.1.9 Consultation with California Native American Tribes

Public Resources Code Section 21080.3.1, *et seq.* (codification of Assembly Bill (AB) 52, 2013-14)) requires that a lead agency, within 14 days of determining that it will undertake a project, must notify in writing any California Native American Tribe traditionally and culturally affiliated with the geographic area of the project if that Tribe has previously requested notification about projects in that geographic area. The notice must briefly describe the project and inquire whether the Tribe wishes to initiate request formal consultation. Tribes have 30 days from receipt of notification to request formal consultation. The lead agency then has 30 days to initiate the consultation, which then continues until the parties come to an agreement regarding necessary mitigation or agree that no mitigation is needed, or one or both parties determine that negotiation occurred in good faith, but no agreement will be made.

The District has not received any written correspondence from a Tribe pursuant to Public Resources Code Section 21080.3.1 requesting notification of proposed project.

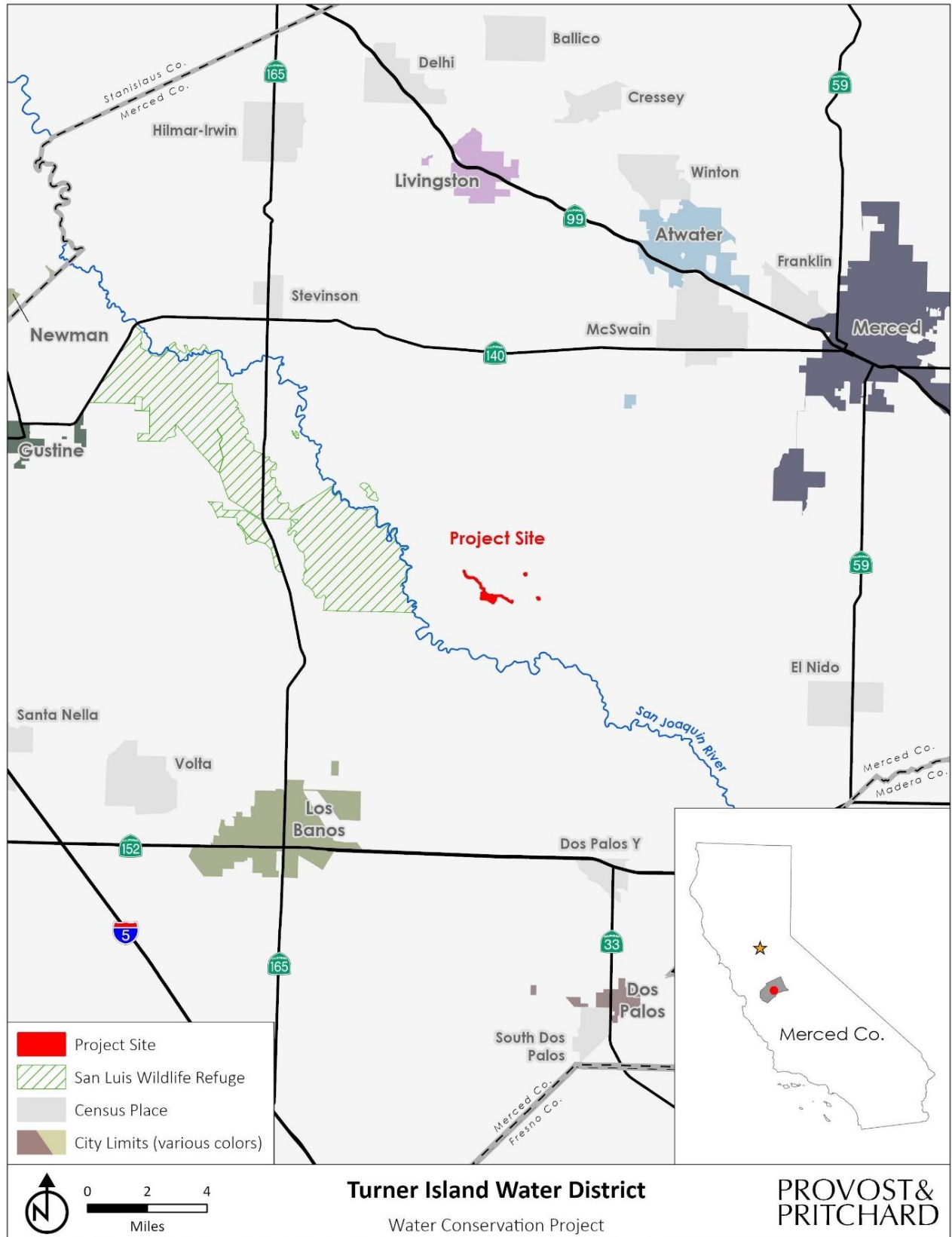


Figure 2-1: Regional Location Map

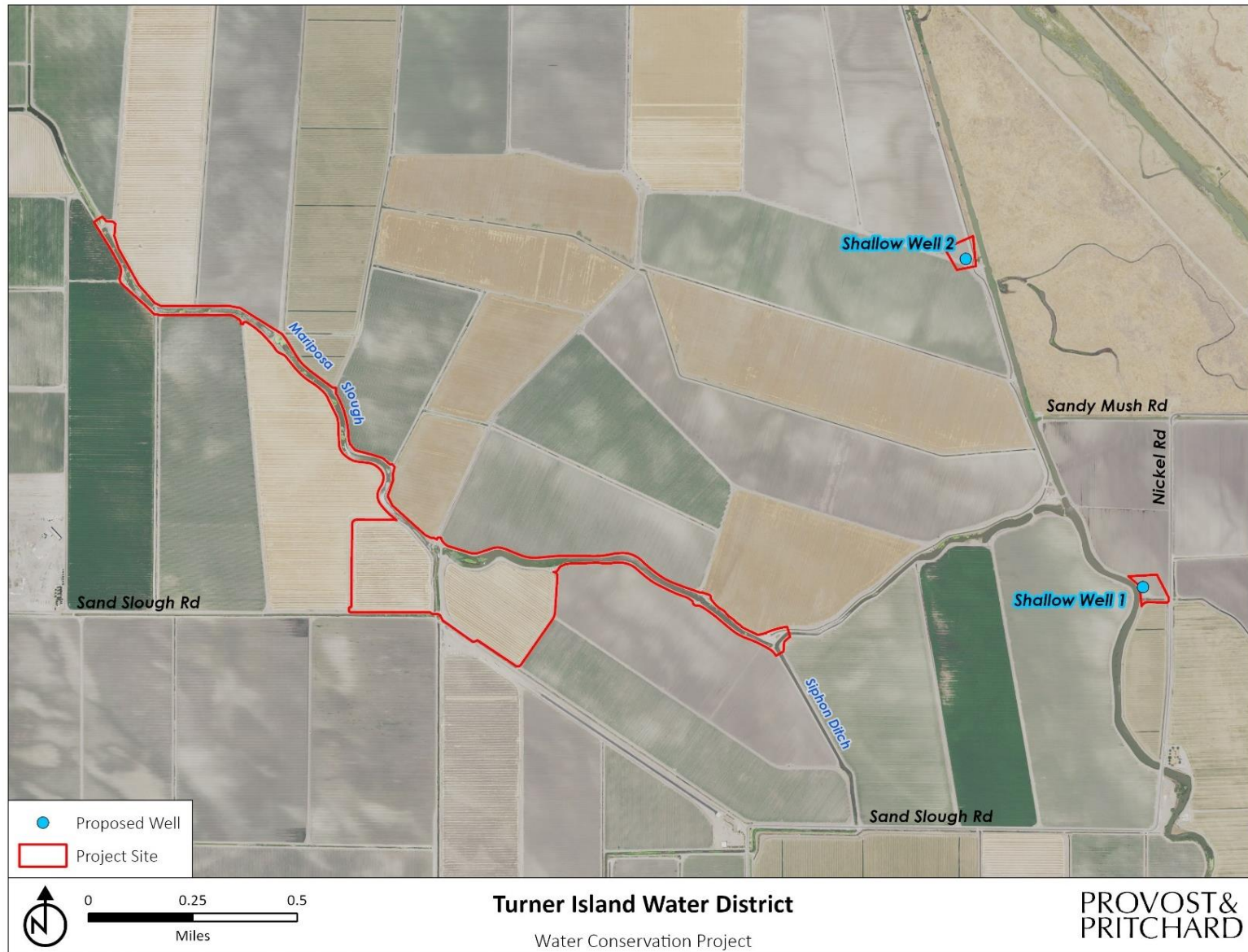


Figure 2-2: Aerial Map of Project Site

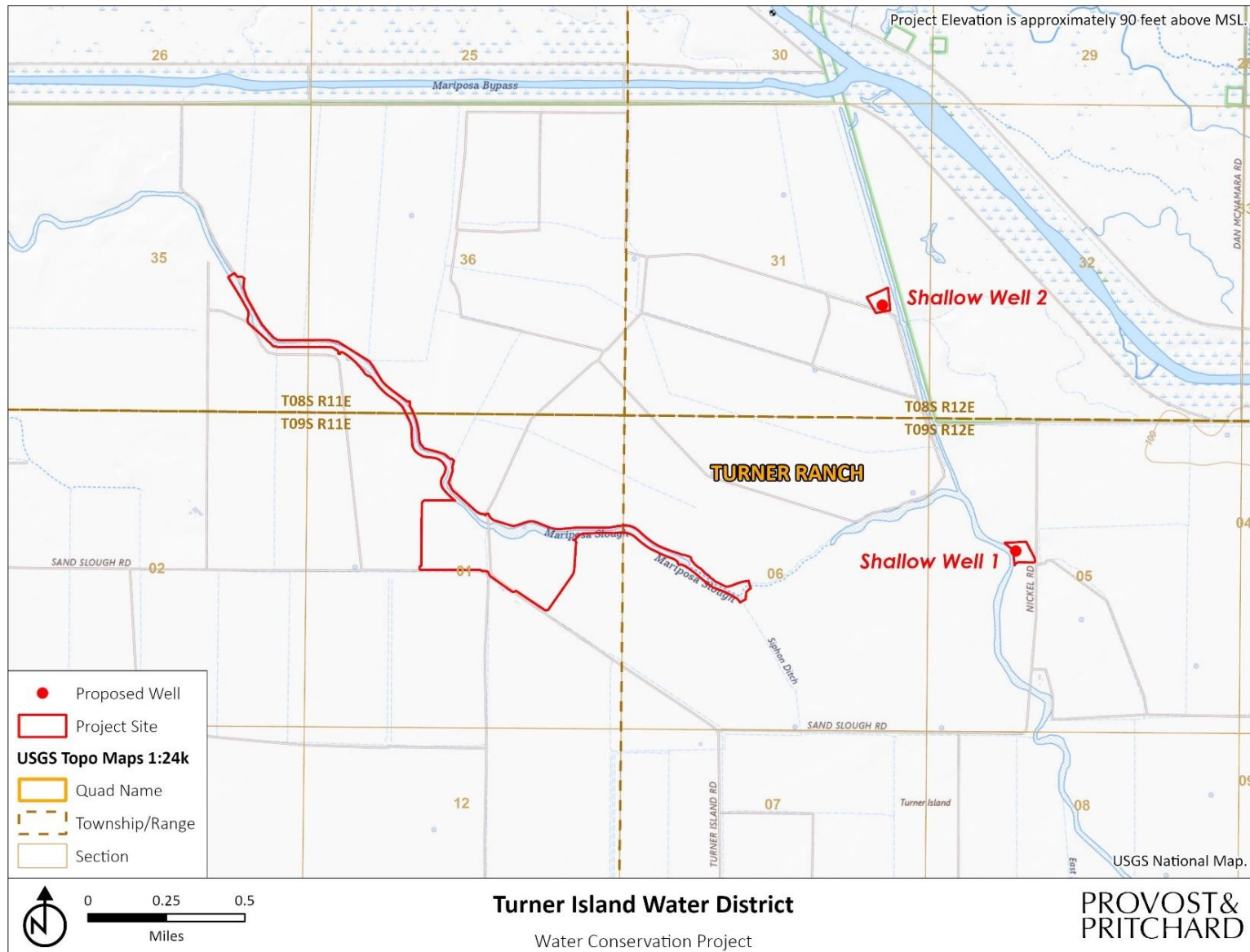


Figure 2-3: Topo Quad Map

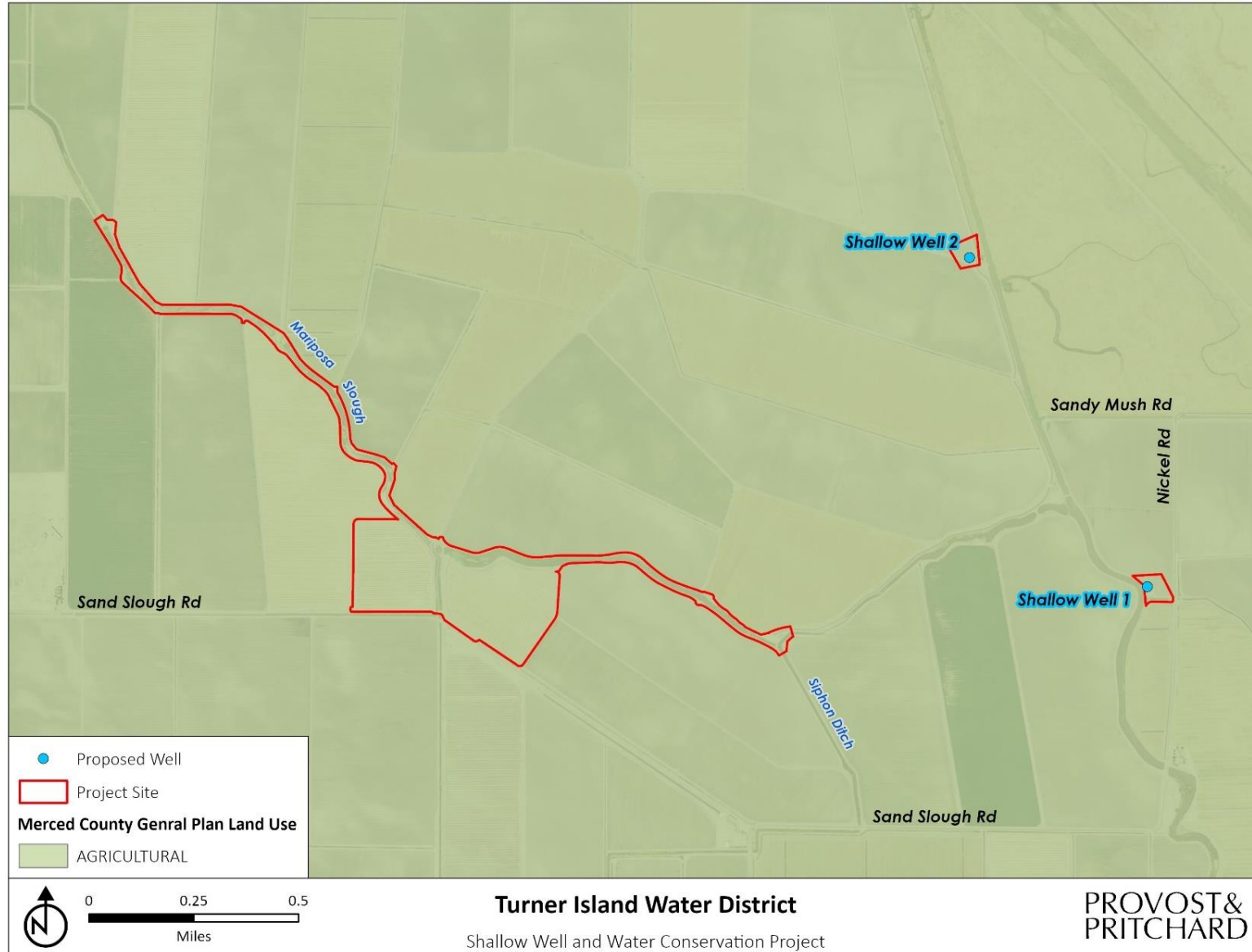


Figure 2-4: General Plan Land Use Designation Map

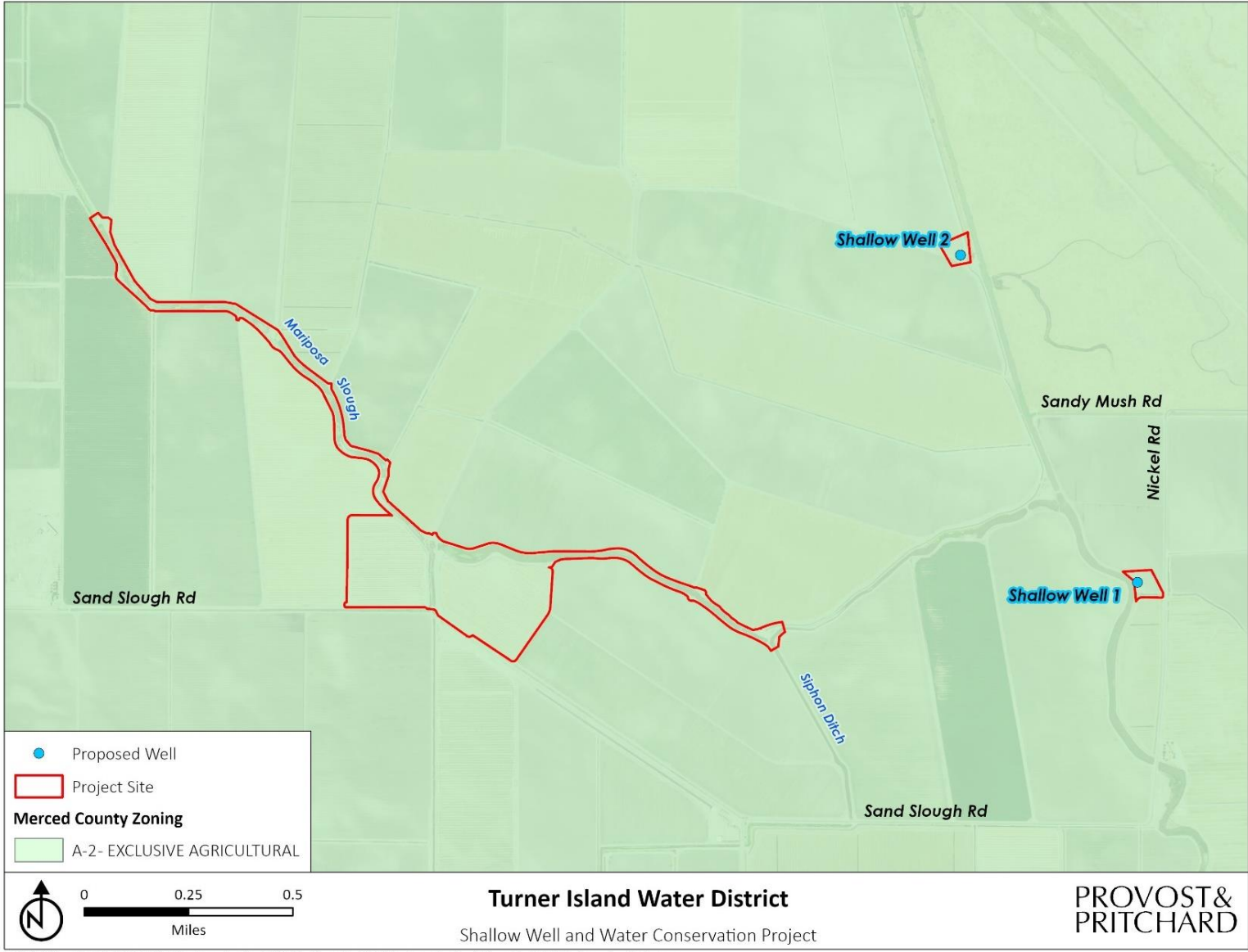


Figure 2-5: Zone District Map

CHAPTER 3 DETERMINATION

3.1 POTENTIAL ENVIRONMENTAL IMPACTS

As indicated by the discussions of existing and baseline conditions, and impact analyses that follow in this Chapter, environmental factors not checked below would have no impacts or less than significant impacts resulting from the project. Environmental factors that are checked below would have potentially significant impacts resulting from the project. Mitigation measures are recommended for each of the potentially significant impacts that would reduce the impact to less than significant.

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

The analyses of environmental impacts in **Chapter 4 Impact Analysis** result in an impact statement, which shall have the following meanings.

Potentially Significant Impact. This category is applicable if there is substantial evidence that an effect may be significant, and no feasible mitigation measures can be identified to reduce impacts to a less than significant level. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.

Less than Significant with Mitigation Incorporated. This category applies where the incorporation of mitigation measures would reduce an effect from a “Potentially Significant Impact” to a “Less than Significant Impact.” The lead agency must describe the mitigation measure(s), and briefly explain how they would reduce the effect to a less than significant level (mitigation measures from earlier analyses may be cross-referenced).

Less than Significant Impact. This category is identified when the proposed Project would result in impacts below the threshold of significance, and no mitigation measures are required.

No Impact. This category applies when a project would not create an impact in the specific environmental issue area. “No Impact” answers do not require a detailed explanation if they are adequately supported by the information sources cited by the lead agency, which show that the impact does not apply to the specific project (e.g. the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g. the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

3.2 DETERMINATION

On the basis of this initial evaluation (to be completed by the Lead Agency):

- ☐ 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.


Signature

07.30.24
Date

Chase Hurley General Manager
Printed Name/Position

CHAPTER 4 ENVIRONMENTAL IMPACT ANALYSIS

4.1 AESTHETICS

Table 4-1: Aesthetics Impacts

Except as provided in Public Resources Code Section 21099, would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have 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 day or nighttime views in the area?	☐	☐	☐	☒

4.1.1 Baseline Conditions

The Project is located in Merced County in the San Joaquin Valley. The San Joaquin Valley is known for being one of the most productive agricultural regions in the United States. The San Joaquin Valley includes various agricultural lands lined with row crops, vineyards, and associated irrigation infrastructure such as canals, groundwater wells, and groundwater recharge basins. The Project area is no different, which is fully engulfed and surrounded by farmland. The Project area includes the Mariposa Slough which intermittently contains water, dependent on the hydrological year, and various field crops. In addition, the northern border of the Project area contains the San Joaquin River, which is the longest river in Central California, spanning approximately 366 miles. The Project area also contains semi-developed County roads and various access roads for farmers to access their property. The Project area does not contain any state highways as the nearest ones are located approximately 16 miles southwest of the Project site. The two nearest State Scenic Highways are both State Route (SR) 152 and Interstate 5 (I-5). These two State Scenic Highways are located approximately 5.5 miles east of the San Luis Reservoir where they intersect each other.

The Project area is predominantly flat, with an elevation of approximately 90 feet above mean sea level. The Project area does not contain any County-designated scenic vistas, nor does it contain any scenic vista-like qualities due to its flat topography.

4.1.2 Impact Analysis

a) Have substantial adverse effect on a scenic vista?

No Impact. The Project area does not contain a County-designated scenic vista. As the Project area is essentially flat, there are no moderate or extreme topographical changes that would produce vista-like qualities. In the absence of a scenic vista, there would be no impact.

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

No Impact. There are no State Scenic Highways within the Project area, nor are there any relatively close. The nearest State Scenic Highways are SR 152 and I-5, which are both located approximately 16 miles southwest of the Project. Therefore, there would be no impact.

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

No Impact. The Project is located in an agriculturally dominated region. The Project vicinity contains field crops, and natural features such as the Mariposa Slough and the San Joaquin River. The Project would include the construction of two recharge basins, two shallow groundwater wells, and supporting infrastructure to existing culverts at road crossings at the Mariposa Slough. Project features are instrumental in supporting the continuance of agricultural operations. The recharge basins would allow additional water to recharge the underlying aquifer, while the shallow groundwater wells would increase the ability to pump water for agricultural operations without increasing potential subsidence issues that would otherwise continue. The Project would blend in with the existing agricultural landscape and would not substantially degrade the visual character of the area. There would be no impact.

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

No Impact. The area surrounding the Project consists primarily of agricultural land. No permanent lighting would be proposed on-site and construction materials are not anticipated to increase the effects of glare. No nighttime vehicular lighting traveling to and from the Project would take place. All as-needed maintenance would occur during daytime hours. Therefore, the Project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area or be inconsistent with existing conditions. There would be no impact.

4.2 AGRICULTURE AND FORESTRY RESOURCES

Table 4-2: Agriculture and Forest Impacts

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☐	☐	☒

4.2.1 Baseline Conditions

The Project is located in Merced County within the San Joaquin Valley. The physical setting of the Project area consists of flat agricultural land containing row crops, orchards, irrigation delivery systems, rural County roads, and other typical rural/agricultural infrastructure. The Project area contains a natural waterway known as the Mariposa Slough, which ultimately connects to the San Joaquin River in the north quadrant of the Project area.

Farmland Mapping and Monitoring Program (FMMP): The FMMP produces maps and statistical data used for analyzing impacts to California’s agricultural resources. Agricultural land is rated according to soil quality and irrigation status; the best quality land is called Prime Farmland. The maps are updated every two years with the use of a computer mapping system, aerial imagery, public review, and field reconnaissance. The California Department of Conservation’s 2018 FMMP is a non-regulatory program that produces “Important Farmland” maps and statistical data used for analyzing impacts on California’s agricultural resources. The Important Farmland maps identify eight land use categories, five of which are agriculture related: prime farmland, farmland of statewide importance, unique farmland, farmland of local importance, and grazing land — rated according to soil quality and irrigation status. Each is summarized below:

- PRIME FARMLAND (P): Farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- FARMLAND OF STATEWIDE IMPORTANCE (S): Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- UNIQUE FARMLAND (U): Farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated but may include non- irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.
- FARMLAND OF LOCAL IMPORTANCE (L): Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.
- GRAZING LAND (G): Land on which the existing vegetation is suited to the grazing of livestock. The minimum mapping unit for Grazing Land is 40 acres.
- URBAN AND BUILT-UP LAND (D): Land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This land is used for residential, industrial, commercial, institutional, public administrative purposes, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.
- OTHER LAND (X): Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry, or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.
- WATER (W): Perennial water bodies with an extent of at least 40 acres.

As demonstrated in **Figure 4-1**, the FMMP for the Project area is designated as Prime Farmland, Farmland of Local Importance, and Unique Farmland.¹

4.2.2 Impact Analysis

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?

Less than Significant Impact. As identified above, the Project area contains land designated as both Prime Farmland and Unique Farmland. Implementation of the Project would not result in any designated farmland to a use utilized for non-agricultural purposes. The Project would include the construction of two recharge basins, two shallow groundwater wells, and supporting infrastructure to existing culverts at road crossings at the Mariposa Slough. The Project would support additional and more efficient groundwater recharge thereby contributing to the area's aquifer to allow existing agricultural operations to continue in a more reliable and sustainable manner. Project implementation would not result in a potentially significant impact. Impacts would be less than significant.

¹ (California Department of Conservation 2019)

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

No Impact. The Project area is zoned exclusively for Exclusive Agricultural, as shown in the Merced County Zoning Map, **Figure 2-5**. The Project would ultimately improve agricultural operations by recharging the underlying aquifer while providing shallow wells to pump water for agricultural operations. None of the Project site is under a Williamson Act contract. There would be no impact.

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

No Impact. The Project area is not zoned for forest land, timberland, or timberland production. The Project area does not contain forestland or timberland. No impact would occur.

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

No Impact. As discussed previously in Impact Analysis “c” of this section, there are no forests or timberland within the Project vicinity. Therefore, there would be no impact.

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?

No Impact. The Project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use. As discussed throughout this section, the Project area is not located in or in the vicinity of forestland, and therefore would not convert forest land to non-forest use. No impact would occur.

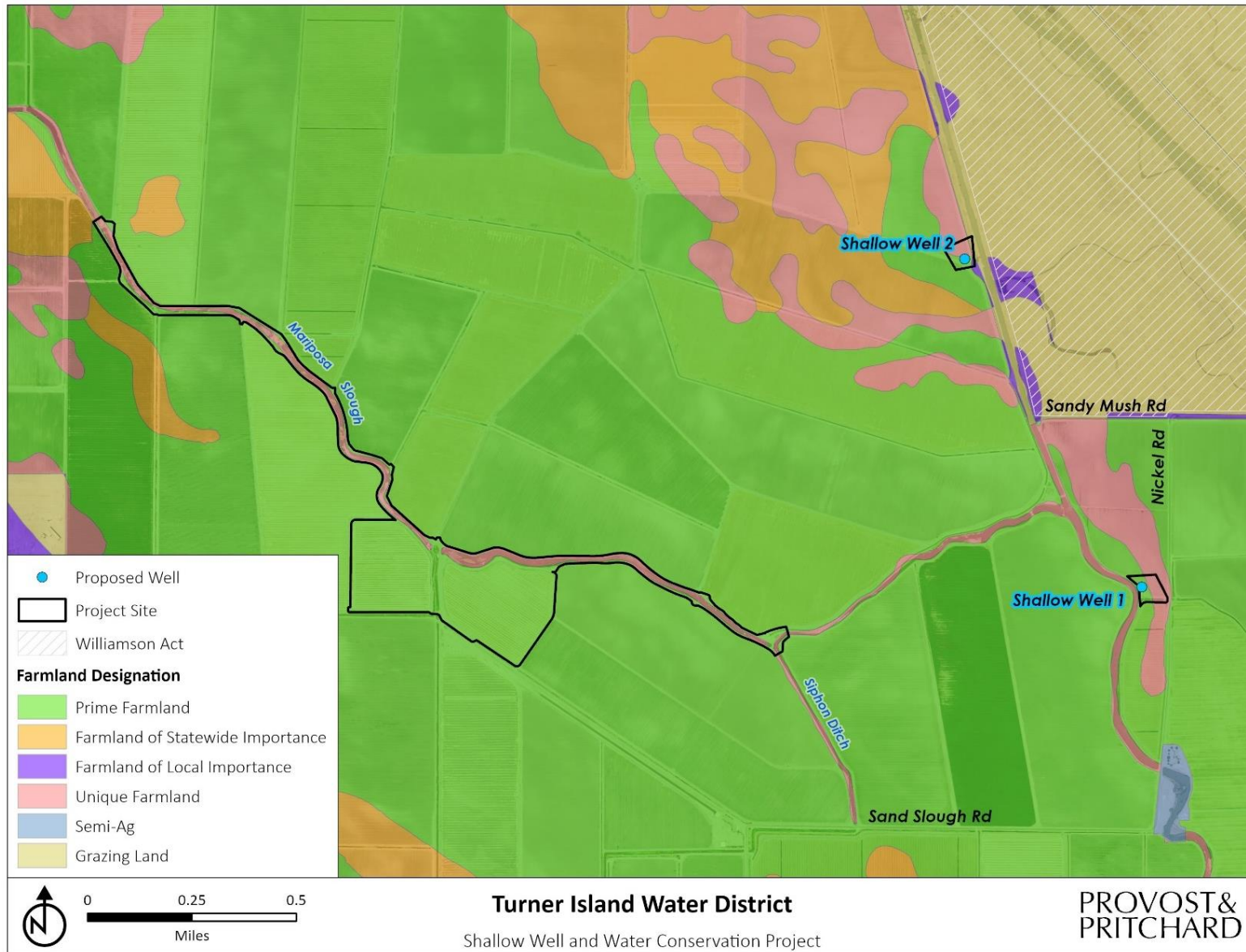


Figure 4-1: FMMP Map

4.3 AIR QUALITY

Table 4-3: Air Quality Impacts

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☐	☒	☐

4.3.1 Baseline Conditions

The Project site is an agricultural site dominated by agricultural land uses.

4.3.2 Applicable Regulations

Under the California Clean Air Act (CCAA), the California Air Resources Board (CARB) is required to designate areas of the State as attainment, nonattainment, or unclassified with respect to applicable standards. An “attainment” designation for an area signifies that pollutant concentrations did not violate the applicable standard in that area. A “nonattainment” designation indicates that a pollutant concentration violated the applicable standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. Depending on the frequency and severity of pollutants exceeding applicable standards, the nonattainment designation can be further classified as serious nonattainment, severe nonattainment, or extreme nonattainment, with extreme nonattainment being the most severe of the classifications. An “unclassified” designation signifies that the data does not support either an attainment or nonattainment designation. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The United States Environmental Protection Agency (USEPA) designates areas for ozone (O₃), carbon monoxide (CO), and nitrogen dioxide (NO₂) as “does not meet the primary standards,” “cannot be classified,” or “better than national standards.” For sulfur dioxide (SO₂), areas are designated as “does not meet the primary standards,” “does not meet the secondary standards,” “cannot be classified,” or “better than national standards.” However, the CARB terminology of attainment, nonattainment, and unclassified is more frequently used. The USEPA uses the same sub-categories for nonattainment status: serious, severe, and extreme. In 1991, the USEPA assigned new nonattainment designations to areas that had previously been classified as Group I, II, or III for particulate matter less than 10 microns in diameter (PM₁₀) based on the likelihood that they would violate national PM₁₀ standards. All other areas are designated “unclassified.”

The State and national attainment status designations pertaining to the San Joaquin Valley Air Basin (SJVAB) are summarized in Table 1. The SJVAB is currently designated as a nonattainment area with respect to the State PM₁₀ standard, ozone, and fine particulate matter 2.5 microns in size (PM_{2.5}) standards. The SJVAB is designated nonattainment for the National Ambient Air Quality Standards (NAAQS) 8-hour ozone and PM_{2.5} standards. On September 25, 2008, the USEPA re-designated the San Joaquin Valley to attainment status for the PM₁₀ NAAQS and approved the PM₁₀ Maintenance Plan.

4.3.3 Thresholds

To assist local jurisdictions in the evaluation of air quality impacts, the San Joaquin Valley Air Pollution Control District (SJVAPCD) has published the Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI). This guidance document includes recommended thresholds of significance to be used for the evaluation of short-term construction, long-term operational, odor, toxic air contaminant, and cumulative air quality impacts. Accordingly, the SJVAPCD-recommended thresholds of significance are used to determine whether implementation of the proposed Project would result in a significant air quality impact. Projects that exceed these recommended thresholds would be considered to have a potentially significant impact to human health and welfare. The thresholds of significance are summarized, as follows:

Particulate Matter (PM₁₀): Construction impacts associated with the proposed Project would be considered significant if the feasible control measures for construction in compliance with Regulation VIII as listed in the SJVAPCD guidelines are not incorporated or implemented, or if project-generated emissions would exceed 15 tons per year (TPY). Operational impacts associated with the proposed Project would be considered significant if the project generates emissions of PM₁₀ that exceed 15 TPY.

Emissions of Ozone Precursors (ROG and NO_x): Construction impacts associated with the proposed Project would be considered significant if the project generates emissions of Reactive Organic Gases (ROG) or nitrogen oxides (NO_x) that exceeds 10 TPY. Operational impacts associated with the proposed Project would be considered significant if the project generates emissions of ROG or NO_x that exceeds 10 TPY.

Conflict with or Obstruct Implementation of Applicable Air Quality Plan: Due to the region's nonattainment status for O₃, PM_{2.5}, and PM₁₀, if the project-generated emissions of either of the ozone precursor pollutants (i.e., ROG and NO_x) or PM₁₀ would exceed the SJVAPCD's significance thresholds, then the project would be considered to conflict with the attainment plans. In addition, if the project would result in a change in land use and corresponding increases in vehicle miles traveled, the project may result in an increase in vehicle miles traveled that is unaccounted for in regional emissions inventories contained in regional air quality control plans.

Local Mobile-Source CO Concentrations: Local mobile source impacts associated with the proposed Project would be considered significant if the project contributes to CO concentrations at receptor locations in excess of the California Ambient Air Quality Standards (i.e., 9.0 ppm for 8 hours or 20 ppm for 1 hour).

Toxic Air Contaminants (TACs): Exposure to toxic air contaminants would be considered significant if the probability of contracting cancer for the Maximally Exposed Individual (i.e., maximum individual risk) would exceed 20 in 1 million or would result in a Hazard Index greater than 1.

Odors: Odor impacts associated with the proposed Project would be considered significant if the project has the potential to frequently expose members of the public to objectionable odors.

Table 4-4: Summary of Ambient Air Quality Standards and Attainment Designation

Pollutant	Averaging Time	California Standards*		National Standards*	
		Concentration*	Attainment Status	Primary	Attainment Status
Ozone (O ₃)	1-hour	0.09 ppm	Nonattainment/ Severe	—	No Federal Standard
	8-hour	0.070 ppm	Nonattainment	0.075 ppm	Nonattainment (Extreme)**
Particulate Matter (PM ₁₀)	AAM	20 µg/m ³	Nonattainment	—	Attainment
	24-hour	50 µg/m ³		150 µg/m ³	
Fine Particulate Matter (PM _{2.5})	AAM	12 µg/m ³	Nonattainment	12 µg/m ³	Nonattainment
	24-hour	No Standard		35 µg/m ³	
Carbon Monoxide (CO)	1-hour	20 ppm	Attainment/ Unclassified	35 ppm	Attainment/ Unclassified
	8-hour	9 ppm		9 ppm	
	8-hour (Lake Tahoe)	6 ppm		—	
Nitrogen Dioxide (NO ₂)	AAM	0.030 ppm	Attainment	53 ppb	Attainment/ Unclassified
	1-hour	0.18 ppm		100 ppb	
Sulfur Dioxide (SO ₂)	AAM	—	Attainment	--	Attainment/ Unclassified
	24-hour	0.04 ppm		--	
	3-hour	—		0.5 ppm	
	1-hour	0.25 ppm		75 ppb	
Lead (Pb)	30-day Average	1.5 µg/m ³	Attainment	—	No Designation/ Classification
	Calendar Quarter	—		--	
	Rolling 3-Month Average	—		0.15 µg/m ³	
Sulfates (SO ₄)	24-hour	25 µg/m ³	Attainment	No Federal Standards	
Hydrogen Sulfide (H ₂ S)	1-hour	0.03 ppm (42 µg/m ³)	Unclassified		
Vinyl Chloride (C ₂ H ₃ Cl)	24-hour	0.01 ppm (26 µg/m ³)	Attainment		
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient: 0.23/km-visibility of 10 miles or more due to particles when the relative humidity is less than 70%.	Unclassified		

* For more information on standards visit: <https://ww3.arb.ca.gov/research/aqqs/aqqs2.pdf>

** No Federal 1-hour standard. Reclassified extreme nonattainment for the Federal 8-hour standard.

***Secondary Standard

Source: <http://www.valleyair.org/aqinfo/attainment.htm>. Accessed 2015

4.3.4 Impact Analysis

a) Would the project conflict with or obstruct implementation of the applicable air quality plan?

Less than Significant Impact. CEQA requires that certain projects be analyzed for consistency with the applicable air quality plan. For a project to be consistent with SJVAPCD air quality plans, the pollutants emitted from a project should not exceed the SJVAPCD emission thresholds or cause a significant impact

on air quality. In addition, emission reductions achieved through implementation of offset requirements are a major component of the SJVAPCD air quality plans. As discussed below, construction of the Project would not result in the generation of criteria air pollutants that would exceed SJVAPCD thresholds of significance. Implementation of SJVAPCD Regulation VIII would further reduce construction dust impacts. Operational emissions associated with the Project would not exceed SJVAPCD established significance thresholds for ROG, NO_x, CO, SO_x, PM₁₀, or PM_{2.5} emissions. Therefore, the Project would not conflict with or obstruct implementation of SJVAPCD air quality plans. The impact would be less than significant.

- b) Would the project 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?

Less than Significant Impact. The results of the modeling are presented in **Table 4-5**. The emissions that would occur during construction activities were compared with the significance threshold for each pollutant. For assumptions in estimating the emissions, please refer to **Appendix A**. As shown in **Table 4-5**, the emissions are below the significance thresholds. Due to the nature of the Project, the Project would result in negligible quantities of operational emissions and would not exceed SJVAPCD established significance thresholds. Therefore, the emissions from the Project would be less than significant.

Table 4-5: Construction Emission Summary, Criteria Air Pollutants

	Emissions (in tons per year)					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Construction Emissions	0.29	2.57	2.54	0.01	0.43	0.22
Significant Threshold	10	10	100	27	15	15
Significant Impact?	No	No	No	No	No	No
Source: Appendix A						

- c) Would the project expose sensitive receptors to substantial pollutant concentrations?

Less than Significant Impact. The Project would require the use of diesel-powered off-road construction equipment. There are no sensitive receptors within 1,000 feet of the Project site. Due to the short duration of construction lasting approximately eight months, exposure to diesel particulate matter would be temporary and limited. Therefore, the impact would be less than significant.

- d) Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Less than Significant Impact. Heavy-duty equipment in the Project area during construction could emit odors, primarily from the equipment exhaust. However, the construction activity would cease when construction is completed. The SJVAPCD addresses odor criteria within the GAMAQI. The District has not established a rule or standard regarding odor emissions, rather, the District has a nuisance rule, which states, "Any project with the potential to frequently expose members of the public to object able odors to be deemed to have a significant impact." The proposed uses are not anticipated to emit any long term objectionable odors. Therefore, objectionable odors affecting a substantial number of people would not occur as a result of the Project. There would be a less than significant impact.

4.4 BIOLOGICAL RESOURCES

Table 4-6: Biological Resources Impacts

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

4.4.1 Baseline Conditions

General

The Project site is located approximately 12 miles southwest of the City of Merced in the central portion of Merced County, California, within the San Joaquin Valley (see [Figure 2-1](#)). The Project site includes existing farm access roads, agricultural fields, and canals, including the Mariposa Slough. The surrounding area consists of the Mariposa Bypass to the North, Merced National Wildlife Refuge to the east, agricultural land to the south, and San Luis National Wildlife Refuge to the west. The topography of the site is relatively flat with an elevation of approximately 90 feet above mean sea level. The Biological Resources Evaluation

prepared for the Project is presented in [Appendix B](#). The Biological Resources Evaluation includes findings and recommendations based on a field survey that took place at the Project site in May 2023.

Like most of California, the Project area experiences a Mediterranean climate. Warm, dry summers are followed by cool, moist winters. In the summer, average high temperatures range between 85- and 95-degrees Fahrenheit (°F), but often exceed 95 °F, and the humidity is generally low. Winter temperatures are often below 60 °F during the day and rarely exceed 70 °F. On average, the San Joaquin Valley receives approximately 12 inches of precipitation in the form of rainfall yearly, most of which occurs between October and March, and the Project area would be expected to receive similar amounts of precipitation.

Hydrology

A watershed is the topographic region that drains into a stream, river, or lake. Watersheds are made up of many smaller subwatersheds that drain into a particular stream, river, or lake. The Project site lies within the Mud Slough-San Joaquin River watershed; Hydrologic Unit Code (HUC): 1804000121 and the Sand Slough-San Joaquin River subwatershed; HUC: 180400012101. The nearest surface water to the Project is Mariposa Slough which runs through the Project site.

Mariposa Slough receives water from a section of the San Joaquin River and also from the Fresno River, Dry Creek, Berenda Slough, and the Chowchilla River. Downstream of the Project site, Mariposa Slough connects back to the San Joaquin River near the San Luis National Wildlife Refuge, and the San Joaquin River continues northwest to the San Joaquin-Sacramento River Delta, near Stockton.

Soil

Eight soil mapping units representing four soil types were identified within the Project site and are listed in [Table 4-7](#), below. The soils in [Table 4-7](#) are displayed with their core properties, according to the Major Land Resource Area of California. All eight soils are primarily used for agriculture, grazing, and pasture.

Table 4-7: List of Soils Located Within the Project Site and Their Basic Properties

Soil	Soil Map Unit	Percent of Project Site	Major Component Hydric Soil	Minor Component Hydric	Drainage	Permeability	Runoff
<i>Merced</i>	Clay loam, slightly saline, 0 to 1 percent slopes	26.3%	Yes	Yes	Somewhat poorly drained	Slow permeability	High runoff
	Clay loam, moderately saline, 0 to 1 percent slopes	5.6%	Yes	Yes	Somewhat poorly drained	Slow permeability	High runoff
	Silt loam, overwashed, slightly saline, 0 to 1 percent slopes	3.8%	Yes	Yes	Somewhat poorly drained	Slow permeability	Medium runoff

Soil	Soil Map Unit	Percent of Project Site	Major Component Hydric Soil	Minor Component Hydric	Drainage	Permeability	Runoff
<i>Piper</i>	Fine sandy loam, strongly saline-alkali, 0 to 3 percent slopes	0.0%	Yes	Yes	Somewhat poorly drained	Moderately slow permeability	Low runoff
<i>Rossi</i>	Clay loam, moderately saline-alkali, 0 to 1 percent slopes	0.6%	Yes	Yes	Poorly drained	Very slow permeability	Very high runoff
	Clay loam, strongly saline-alkali, 0 to 1 percent slopes	1.6%	Yes	No	Poorly drained	Very slow permeability	Very high runoff
<i>Temple</i>	Clay loam, slightly saline, 0 to 1 percent slopes	1.9%	Yes	Yes	Somewhat poorly drained	Moderately slow to slow permeability	Medium runoff
	Loam, slightly saline, 0 to 1 percent slopes	24.4%	Yes	Yes	Somewhat poorly drained	Moderately slow to slow permeability	Medium runoff
<i>Water</i>	-	35.0%	-	-	-	-	-

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions such that under sufficiently wet conditions, hydrophytic vegetation can be supported. All soils are rated hydric except for Rossi clay loam, strongly saline-alkali, 0 to 1 percent slopes, which is rated as predominantly hydric.

Biotic Habitats

Four biotic habitats were observed within the Project area and included ruderal, riverine, agricultural, and seasonal wetland. These habitats and their constituent plant and animal species are described in more detail in the following sections. The biotic habitats within the Project site are summarized below and approximate boundaries of these habitats are presented in [Figure 4-2](#). Selected photographs of these habitats are presented in [Appendix B: Biological Resources Evaluation](#).

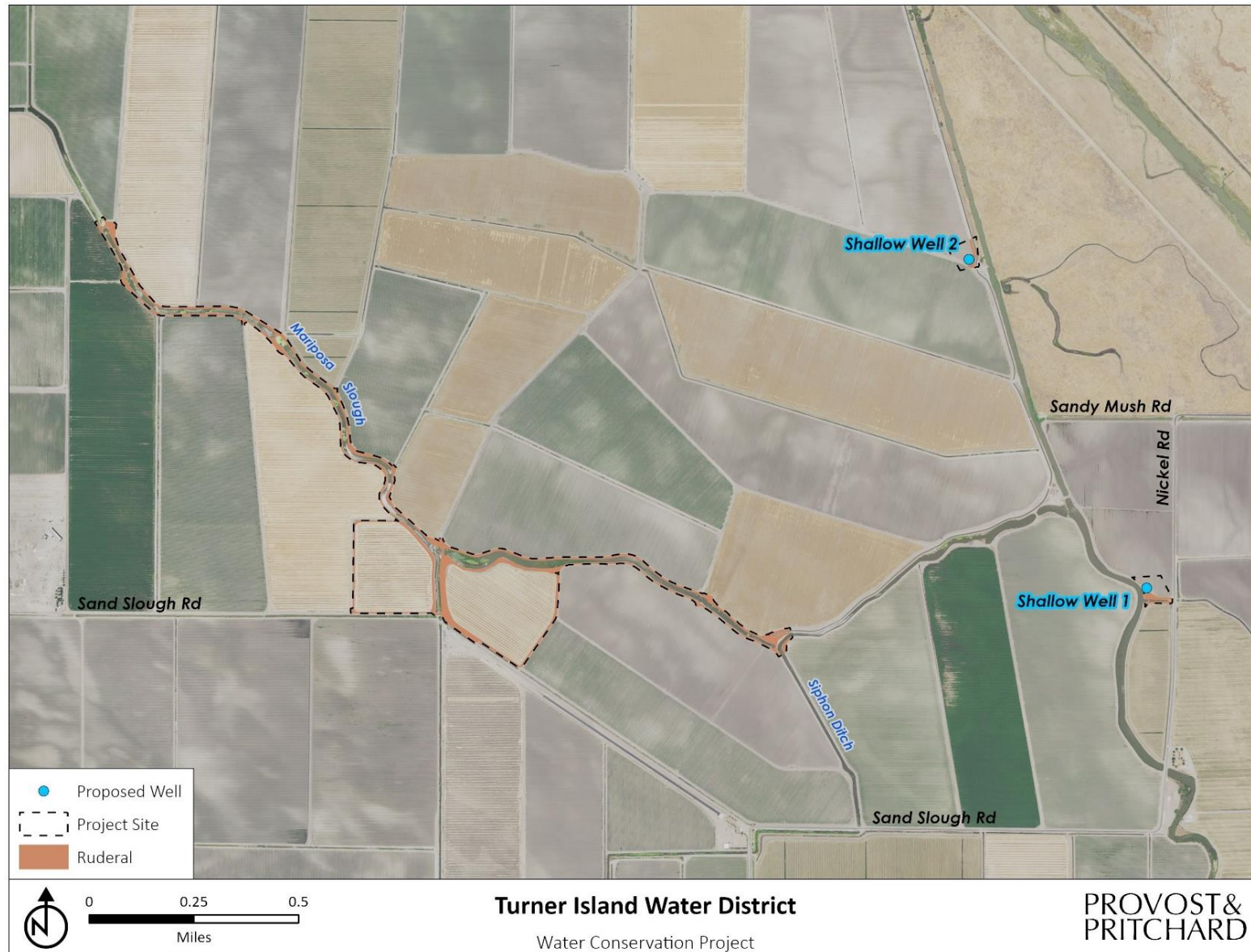


Figure 4-2: Habitats Map

Ruderal

The ruderal habitat within the Project area consists primarily of dirt access roads along the banks of the Mariposa Slough. This habitat supported various plant species such as alkali mallow (*Malvella leprosa*), bristly oxtongue (*Helminthotheca echioide*), brome (*Bromus* sp.), field bindweed (*Convolvulus arvensis*), flax-leaved horseweed (*Conyza bonariensis*), milk thistle (*Silybum marianum*), poison hemlock (*Conium maculatum*), sea clubrush (*Bolboschoenus maritimus*), and Tex-Mex tobacco (*Nicotiana plumbaginifolia*).

Bird species such as mourning dove (*Zenaida macroura*) and red-tailed hawk (*Buteo jamaicensis*) were seen foraging over this habitat at the time of the survey. Other disturbance tolerant bird species such as northern mockingbirds (*Mimus polyglottos*) and house finches (*Carpodacus mexicanus*) could be expected to utilize these ruderal lands, as well as killdeer (*Charadrius vociferus*), which could nest on the ground in this habitat.

Riverine

The riverine habitat within the Project area occurred primarily within Mariposa Slough and was dominated by broadleaf cattail (*Typha latifolia*), floating primrose-willow (*Ludwigia peploides*), hardstem bulrush (*Schoenoplectus acutus*), and sea clubrush (*Bolboschoenus maritimus*). Approximately 100 red-winged blackbirds (*Agelaius phoeniceus*) were observed within the emergent vegetation throughout the Project area.

Predatory wading birds such as great blue heron (*Ardea herodias*) and great egret (*Ardea alba*) were observed foraging in this habitat. Cliff swallow (*Petrochelidon pyrrhonota*) nesting activity was also observed under a small bridge over the Mariposa Slough within the Project area.

This habitat could potentially provide value to a variety of wildlife. Amphibians such as the Sierran tree frog (*Pseudacris sierra*) and western toad (*Anaxyrus boreas*) could breed in this habitat, and there is prominent soil cracking in the northwestern corner of the site which could support western spadefoot (*Spea hammondi*). It could also potentially support western pond turtle (*Actinemys marmorata*) or fish species common to the San Joaquin Valley.

Agricultural

At the time of the survey, the portion of the Project area which consisted of an agricultural field was planted with tomato (*Solanum lycopersicum*). Other fields in the surrounding area were growing common wheat (*Triticum aestivum*) and onion (*Allium cepa*). Red-winged blackbirds were seen foraging within the agricultural fields. A pair of Swainson's hawks (*Buteo swainsoni*) were also seen exhibiting foraging behavior over the agricultural land in the area. Similar species could be expected to utilize this habitat as the species expected to use the ruderal habitat within the Project area.

Seasonal Wetland

Seasonal wetland habitat is restricted to a small area of the northwestern portion of the Project site. At the time of the field survey, there were a few inches of standing water present in some tire ruts and small depressions. The water is likely a result of overflow from Mariposa Slough during periods of high-water levels. This area is unlikely to support amphibious or crustaceous wildlife, as Mariposa Slough likely washes out this area periodically and there is an abundance of predators in the area due to the proximity to the San Joaquin River.

Various plant species were observed in this habitat and included species such as mature willows (*Salix* sp.), alkali weed (*Cressa truxillensis*), bristly oxtongue, common spikeweed (*Centromadia pungens*), common

sunflower (*Helianthus annuus*), creeping saltbush (*Atriplex semibaccata*), hyssop loosestrife (*Lythrum hyssopifolia*), prickly lettuce (*Lactuca serriola*), prickly sowthistle (*Sonchus asper*), rabbitfoot grass (*Polypogon monspeliensis*), and shortpod mustard (*Hirschfeldia incana*). Bird species including great-horned owl (*Bubo virginianus*), western kingbird (*Tyrannus verticalis*), and western meadowlark (*Sturnella neglecta*) were observed in this habitat.

Wildlife and Plant Species

A query of the California Natural Diversity Database (CNDDDB) for occurrences of special status plant and animal species was conducted for the *San Luis Ranch* and *Turner Ranch* 7.5-minute United States Geological Survey (USGS) quadrangles that contain the Project site, and for the 10 surrounding USGS quadrangles: *Arena*, *Atwater*, *Delta Ranch*, *Gustine*, *Ingomar*, *Los Banos*, *Sandy Mush*, *Santa Rita Bridge*, *Stevinson*, and *Volta*. These species, and their potential to occur within the Project site, are listed in [Table 4-8](#) and [Table 4-9](#) on the following pages. Other special status species that did not show up in the CNDDDB query, but have the potential to occur in the vicinity, are also included in [Table 4-8](#) and [Table 4-9](#). Species lists obtained from CNDDDB and the United States Fish and Wildlife Service's Information for Planning and Consultation system are available in [Appendix B: Biological Resources](#) Evaluation. All relevant sources of information, as discussed in the *Study Methodology* section of this report, as well as field observations, were used to determine if any special status species are known to be within the Project site.

Table 4-8: List of Special Status Animals with Potential to Occur Within the Project Site and/or in the Vicinity.

Species	Status*	Habitat	Occurrence Within the Project Site
American Badger (<i>Taxidea taxus</i>)	CSSC	Grasslands, savannas, and mountain meadows near timberline are preferred. Most abundant in drier open spaces of shrub and grassland. Burrows in soil.	Absent. The Project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately five miles southwest of the Project site in 1930.
Blunt-nosed Leopard Lizard (<i>Gambelia sila</i>)	FE, CE, CFP	Inhabits semi-arid grasslands, alkali flats, low foothills, canyon floors, large washes, and arroyos, usually on sandy, gravelly, or loamy substrate, sometimes on hardpan. Often found where there are abundant rodent burrows in dense vegetation or tall grass. Cannot survive on lands under cultivation. Known to bask on kangaroo rat mounds and often seeks shelter at the base of shrubs, in small mammal burrows, or in rock piles. Adults may excavate shallow burrows but rely on deeper pre-existing rodent burrows for hibernation and reproduction.	Absent. The Project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately seven miles southeast of the Project site in 1967.
Burrowing Owl (<i>Athene cunicularia</i>)	CSSC	Resides in open, dry annual or perennial grasslands, deserts, and scrublands with low growing vegetation. Nests underground in existing burrows created by mammals, most often ground squirrels. Can also be found in human-made structures, such as pipes.	Unlikely. The Project site lacks the preferred foraging habitat of this species. No evidence of this species or burrows which could be utilized by this species were observed during the field survey.

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Species	Status*	Habitat	Occurrence Within the Project Site
			The nearest recorded observation of this species occurred approximately nine miles east of the Project site in 2007.
California Tiger Salamander (<i>Ambystoma californiense</i>)	FT, CT	Requires vernal pools or seasonal ponds for breeding and small mammal burrows for aestivation. Generally found in grassland and oak savannah plant communities in central California from sea level to 1500 feet in elevation. Can migrate up to 1.3 miles to breed.	Unlikely. The Project area lacks quality breeding habitat for this species. Seasonal ponding within the site appears to occur due to overflow from the slough, which would likely wash out, or introduce predators of, this species. The nearest recorded observation of this species occurred in San Luis National Wildlife Refuge, approximately 0.5 miles west of the Project site, in 1993.
Coast Horned Lizard (<i>Phrynosoma blainvillii</i>)	CSSC	Found in grasslands, coniferous forests, woodlands, and chaparral, primarily in open areas with patches of loose, sandy soil and low-lying vegetation in valleys, foothills, and semi-arid mountains. Frequently found near ant hills and along dirt roads in lowlands along sandy washes with scattered shrubs.	Absent. The Project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately five miles north of the Project site in 1989.
Conservancy Fairy Shrimp (<i>Branchinecta conservatio</i>)	FE	Endemic to the grasslands of the northern two-thirds of the Central Valley. Found in large, turbid pools.	Unlikely. The Project area lacks quality breeding habitat for this species. Seasonal ponding within the site appears to occur due to overflow from the slough, which would likely wash out, or introduce predators of, this species. The nearest recorded observation of this species occurred approximately two miles north of the Project site in 2015.
Crotch Bumble Bee (<i>Bombus crotchii</i>)	CCE	Inhabits open grassland and scrub habitats. Food plant genera include <i>Antirrhinum</i> , <i>Phacelia</i> , <i>Clarkia</i> , <i>Dendromecon</i> , <i>Eschscholzia</i> , and <i>Eriogonum</i> .	Absent. The Project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately 12.5 miles south of the Project site in 1952.
Fresno Kangaroo Rat (<i>Dipodomys nitratooides exilis</i>)	FE, CE	An inhabitant of alkali sinks and open grassland habitats in Merced, Kings Fresno, and Madera counties. Prefers bare, alkaline, clay-based soils subject to seasonal inundation with more friable soil mounds around shrubs and grasses. The most recent recorded observation of this species in California was in 1992 in Fresno County.	Unlikely. The Project site lacks the preferred habitat of this species. There are no recorded observations of this species within the 12-quad CNDDDB search.
Giant Gartersnake (<i>Thamnophis gigas</i>)	FT, CT	Occurs in marshes, sloughs, drainage canals, irrigation ditches, rice fields, and adjacent uplands. Prefers locations	Unlikely. Mariposa Slough provides suitable foraging habitat for this species, however small mammal

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Species	Status*	Habitat	Occurrence Within the Project Site
		with emergent vegetation for cover and open areas for basking. This species uses small mammal burrows adjacent to aquatic habitats for hibernation in the winter and to escape from excessive heat in the summer.	burrows required by this species were absent from the site. The nearest recorded observation of this species occurred in San Luis National Wildlife Refuge, approximately 0.5 miles west of the Project site, in 1974.
Golden Eagle (<i>Aquila chrysaetod</i>)	CFP	This species typically nests on cliff ledges or large trees, rarely on the ground. They prefer an expanse of open terrain and are found over tundra, prairie, rangeland, desert, and grasslands.	Possible. This species could potentially nest within several trees large eucalyptus trees adjacent to the northern boundary of the Project area. The nearest recorded observation of this species occurred approximately 13.5 miles southwest of the Project site in 1987.
Green Sturgeon - Southern DPS (<i>Acipenser medirostris</i>)	FT	Spawns in Sacramento, Feather, and Yuba Rivers. Presence in upper Stanislaus and San Joaquin Rivers may indicate spawning. Non-spawning adults occupy marine/estuarine waters. Delta estuaries are important for rearing juveniles.	Absent. This species could not occur within Mariposa Slough because there are no accessible connections to the San Joaquin River. The nearest recorded observation of this species occurred in the San Joaquin River, approximately 12.5 miles northwest of the Project site in 2020.
Hardhead (<i>Mylopharodon conocephalus</i>)	CSSC	Occurs in low- to mid-elevation streams in the Sacramento-San Joaquin river drainages. Clear, deep pools with sand-gravel-boulder bottoms and slow-moving water are required. This species is often sympatric with Sacramento pikeminnow and Sacramento sucker. Hardhead are typically absent from streams occupied by centrarchids and from heavily altered habitats.	Unlikely. The Project site lacks the specific habitat requirements of this species. The nearest recorded observation of this species occurred approximately three miles north of the Project site in Bear Creek, East Side Canal, Atwater Drain, and adjacent freshwater ponds in 1989.
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	CSSC	Frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low herbaceous cover. In the Central Valley, nests in riparian areas, desert scrub, and agricultural hedgerows.	Possible. Suitable nesting and foraging habitat for this species is present within the Project area. The nearest recorded observation of this species occurred approximately eight miles west of the Project site in 2014.
Longhorn Fairy Shrimp (<i>Branchinecta longiantenna</i>)	FE	Inhabits clear to turbid vernal pools or seasonally ponded areas.	Unlikely. The Project area lacks high quality breeding habitat for this species. Seasonal ponding within the site appears to occur due to overflow from the slough, which would likely wash out, or introduce predators of, this species. The nearest recorded observation of this species occurred in the vicinity of

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Species	Status*	Habitat	Occurrence Within the Project Site
			San Luis National Wildlife Reserve in 2008.
Monarch Butterfly (<i>Danaus plexippus</i>)	FC	Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby. Larval host plants consist of milkweeds (<i>Asclepias</i> sp.). Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico.	Unlikely. The Project site lacks high quality food sources, larval host plants, and suitable roost sites. There are no recorded observations of this species within the 12-quad CNDDDB search.
Northern California Legless Lizard (<i>Anniella pulchra</i>)	CSSC	Found primarily underground, burrowing in loose, sandy soil. Forages in loose soil and leaf litter during the day. Occasionally observed on the surface at dusk and night.	Absent. The Project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately five miles north of the Project site in 2009.
Northern Harrier (<i>Circus hudsonius</i>)	CSSC	Nests and forges in various grasslands, including salt grass in desert sinks, riparian scrub, and wetland edges. Nests are constructed on the ground from sticks in wet areas, usually on the edge of marshes.	Possible. This species could nest in emergent vegetation within the Project area and forage in nearby grasslands. The nearest recorded observation of this species occurred within San Luis National Wildlife Refuge in 1972.
Northern Leopard Frog (<i>Lithobates pipiens</i>)	CSSC	Inhabits grassland, wet meadows, potholes, forests, woodland, brushlands, springs, canals, bogs, marshes, and reservoirs. Generally, prefers permanent water with abundant riparian vegetation.	Unlikely. The Project area lacks the preferred habitat of this species. The nearest recorded observation of this species occurred approximately one mile east of the Project site in 1976.
Pallid Bat (<i>Antrozous pallidus</i>)	CSSC	Found in grasslands, chaparral, and woodlands, where it feeds on ground- and vegetation-dwelling arthropods, and occasionally takes insects in flight. Prefers to roost in rock crevices, but may also use tree cavities, caves, bridges, and other man-made structures.	Unlikely. The Project site lacks high quality roosting habitat for this species. The nearest recorded observation of this species occurred approximately 15 miles northwest of the Project site in 1999.
San Joaquin Kit Fox (<i>Vulpes macrotis mutica</i>)	FE, CT	Uses underground dens with multiple entrances in alkali sink, valley grassland, and woodland habitats in valleys and adjacent foothills.	Unlikely. The Project site lacks suitable habitat for this species. This species could potentially pass through the Project site. The nearest recorded observation of this species occurred approximately one mile northwest of the Project site in 1975.
Steelhead – Central Valley DPS (<i>Oncorhynchus mykiss irideus</i> pop.11)	FT	This winter-run fish begins migration to fresh water during peak flows during December and February. Spawning season is typically from February to April. After hatching, they move to deeper, mid-channel habitats in late summer and fall. In general, both juveniles and adults prefer complex	Absent. This species could not occur within Mariposa Slough because there are no accessible connections to the San Joaquin River. The nearest recorded observation of this species occurred in the San

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Species	Status*	Habitat	Occurrence Within the Project Site
		habitat with boulders, submerged clay and undercut banks, and large woody debris.	Joaquin River, just west of the Project site, in 2013.
Swainson's Hawk (<i>Buteo swainsoni</i>)	CT	Nests in large trees in open areas adjacent to grasslands, grain or alfalfa fields, or livestock pastures suitable for supporting rodent populations.	Possible. A pair was observed flying over the Project site. This species could potentially nest within several trees large eucalyptus trees adjacent to the northern boundary of the Project area. The nearest recorded observation of this species occurred approximately 0.25 miles northwest of the Project site in 1988.
Tricolored Blackbird (<i>Agelaius tricolor</i>)	CT, CSSC	Nests colonially near fresh water in dense cattails or tules, or in thickets of riparian shrubs. Forages in grassland and cropland. Large colonies are often found on dairy farm forage fields.	Possible. The Project site contains suitable nesting and foraging habitat for this species. The nearest recorded observation of this species occurred approximately one mile east of the Project site in 1987.
Valley Elderberry Longhorn Beetle (<i>Desmocerus californicus dimorphus</i>)	FT	Lives in mature elderberry shrubs of the Central Valley and foothills. Adults are active from March to June.	Absent. The Project site lacks suitable habitat for this species. No elderberry shrubs were observed during the field survey. There are no recorded observations of this species within the 12-quad CNDDDB search.
Vernal Pool Fairy Shrimp (<i>Branchinecta lynchi</i>)	FT	Occupies vernal pools, with clear to tea-colored water, in grass or mud-bottomed swales, and basalt depression pools.	Unlikely. The Project area lacks quality breeding habitat for this species. Seasonal ponding within the site appears to occur due to overflow from the slough, which would likely wash out, or introduce predators of, this species. The nearest recorded observation of this species occurred approximately one mile north of the Project site in 2015.
Vernal Pool Tadpole Shrimp (<i>Lepidurus packardii</i>)	FE	Occurs in vernal pools, with clear to tea-colored water, in grass or mud-bottomed swales, and basalt depression pools.	Unlikely. The Project area lacks high quality breeding habitat for this species. Seasonal ponding within the site appears to occur due to overflow from the slough, which would likely wash out, or introduce predators of, this species. The nearest recorded observations of this species occurred within San Luis National Wildlife Refuge, west of the Project site, in 1993.
Western Pond Turtle (<i>Emys marmorata</i>)	CSSC	An aquatic turtle of ponds, marshes, slow-moving rivers, streams, and irrigation ditches with riparian	Possible. Suitable nesting and foraging habitat for this species is present within the Project area.

Species	Status*	Habitat	Occurrence Within the Project Site
		vegetation. Requires adequate basking sites and sandy banks or grassy open fields to deposit eggs.	The nearest recorded observation of this species occurred approximately two miles northwest of the Project site in 2002.
Western Red Bat (<i>Lasiurus blossevillii</i>)	CSSC	Roosts primarily in trees from sea level up through mixed conifer forests. Typically found in mature cottonwoods, sycamores, and oaks. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	Unlikely. The Project area lacks the preferred habitat of this species. The nearest recorded observation of this species occurred approximately 15.5 miles northwest of the Project site in 1999.
Western Spadefoot (<i>Spea hammondi</i>)	CSSC	The majority of the time this species is terrestrial and occurs in small mammal burrows and soil cracks, sometimes in the bottom of dried pools. Prefers open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Vernal pools or temporary wetlands, lasting a minimum of three weeks, which do not contain bullfrogs, fish, or crayfish are necessary for breeding.	Possible. This species could potentially breed in nearby vernal pools and be found in the soil cracks within the Project area. The nearest recorded observations of this species occurred within San Luis National Wildlife Refuge, west of the Project site, in 1993.
Yellow Rail (<i>Coturnicops noveboracensis</i>)	CSSC	This species requires densely vegetated sedge marshes or meadows with moist soil or shallow standing water to breed. There are small, isolated breeding populations of this species in northern California.	Unlikely. The Project site is outside of the current known range of this species. The nearest recorded observation of this species occurred approximately 10 miles southwest of the Project site in 1911.

Table 4-9: List of Special Status Plants with Potential to Occur Within the Project Site and/or in the Vicinity.

Species	Status*	Habitat	Occurrence Within the Project Site
Alkali Milk-vetch (<i>Astragalus tener</i> var. <i>tener</i>)	CNPS 1B	Found in alkali soils in the San Joaquin Valley and throughout the San Francisco Bay Delta region of California in low and flooded areas at elevation below approximately 200 feet. Blooms March – June.	Possible. The Project site contains suitable alkali soils for this species. This species could potentially occur in the seasonal wetland habitat within the Project area. The nearest recorded observation of this species occurred approximately four miles north of the Project site in 1994.
Alkali-sink Goldfields (<i>Lasthenia chrysantha</i>)	CNPS 1B	Found in vernal pool and wet saline flat habitats. Occurrences documented in the Central Valley at elevations below approximately 700 feet. Blooms February - April.	Possible. The Project site contains suitable alkali soil for this species. This species could potentially occur in the seasonal wetland habitat within the Project area.

Species	Status*	Habitat	Occurrence Within the Project Site
			The nearest recorded observation of this species occurred approximately 3.5 miles north of the Project site in 2008.
Brittlescale (<i>Atriplex depressa</i>)	CNPS 1B	Found in the Central Valley in alkaline or clay soils, typically in meadows or annual grassland at elevations below approximately 1,100 feet. Sometimes associated with vernal pools. Blooms June–October.	Unlikely. There are no meadows or annual grassland habitats within the site. The nearest recorded observation of this species occurred approximately 3.5 miles north of the Project site in 1992.
California Alkali Grass (<i>Puccinellia simplex</i>)	CNPS 1B	Found in the San Joaquin Valley and other parts of California in saline flats and mineral springs within valley grassland and wetland-riparian communities at elevations below 3,000 feet. Blooms March–May.	Unlikely. The Project site does not contain saline flats or mineral springs. The nearest recorded observation of this species occurred approximately six miles south of the Project site in 1978.
Colusa Grass (<i>Neostapfia colusana</i>)	FT, CE, CNPS 1B	Found in vernal pools in the San Joaquin Valley at elevations below approximately 500 feet. Blooms May – August.	Absent. The Project site lacks suitable vernal pool habitat. The nearest recorded observation of this species occurred approximately 2.5 miles north of the Project site in 2001.
Coulter’s Goldfields (<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>)	CNPS 1B	Found on alkaline or saline soils in vernal pools and playas in grassland at elevations below 4,500 feet. Blooms April–May.	Unlikely. The Project site lacks suitable vernal pool habitat. The nearest recorded observation of this species occurred approximately four miles north of the Project site in 2002.
Delta Button-celery (<i>Eryngium racemosum</i>)	CE, CNPS 1B	Found in seasonally flooded clay depressions in floodplains at elevations between approximately 10 and 100 feet. Blooms June – August.	Possible. This species could occur within the seasonal wetland habitat within the Project site. The nearest recorded observation of this species occurred approximately 0.25 miles from the Project site in 1986.
Heartscale (<i>Atriplex cordulata</i> var. <i>cordulata</i>)	CNPS 1B	Found in the Central Valley in saline or alkaline soils within shadscale scrub, valley grassland, and wetland-riparian communities at elevations below approximately 300 feet. Blooms June–July.	Possible. The Project site contains suitable saline and alkaline soils for this species. This species could potentially occur within the seasonal wetland habitat within the Project area. The nearest recorded observation of this species occurred approximately two miles northeast of the Project site in 1998.

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Species	Status*	Habitat	Occurrence Within the Project Site
Heckard's Pepper-grass (<i>Lepidium latipes</i> var. <i>heckardii</i>)	CNPS 1B	Facultative wetland plant species which grows at elevations below approximately 3,000 feet. Found in alkaline soils in valley and foothill grasslands as well as vernal pools. Blooms March – June.	Possible. The Project site contains suitable saline and alkaline soils for this species. This species could potentially occur within the seasonal wetland habitat within the Project area. The nearest recorded observation of this species occurred approximately four miles north of the Project site in 2002.
Hispid Salty Bird's-beak (<i>Chloropyron molle</i> ssp. <i>hispidum</i>)	CNPS 1B	Grows in the damp, alkali soils of meadows, playas, and sinks in the San Joaquin Valley and Delta-Bay region of California. Found at elevations below approximately 500 feet. Blooms June – July.	Possible. The Project site contains suitable saline and alkaline soils for this species. This species could potentially occur within the seasonal wetland habitat within the Project area. The nearest recorded observation of this species occurred approximately three miles west of the Project site in 1986.
Hoover's Spurge (<i>Euphorbia hooveri</i>)	FT, CNPS 1B	Found in the Central Valley in vernal pools within valley grassland, freshwater wetland, and riparian communities at elevations below 800 feet. Blooms July – September.	Possible. This species could potentially occur within the seasonal wetland habitat within the Project area. The nearest recorded observation of this species occurred approximately 2.5 miles north of the Project site in 1987.
Lesser Saltscale (<i>Atriplex minuscula</i>)	CNPS 1B	Found in the San Joaquin Valley in sandy, alkaline soils in alkali scrub, valley and foothill grassland, and alkali sink communities at elevations below 750 feet. Blooms April –October.	Absent. The Project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately five miles east of the Project site in 2017.
Northern Slender Pondweed (<i>Stuckenia filiformis</i> ssp. <i>alpina</i>)	CNPS 2B	Found in shallow, clear water of lakes and drainage channels at elevations between 15 feet and 7,500 feet. Blooms May - July. Found primarily in the central High Sierra Nevada and San Francisco Bay regions.	Absent. The Project site is outside of the current known range of this species. The nearest recorded observation of this species occurred approximately 11.5 miles west of the Project site in 1948.
Prostrate Vernal Pool Navarretia (<i>Navarretia prostrata</i>)	CNPS 1B	Found in the San Joaquin Valley as well as areas along the central and southern coast of California. Grows in a variety of grassland and wetland habitats in mesic, alkaline soils at elevations below 2,300 feet. Blooms April – July.	Possible. The Project site contains suitable alkaline soil for this species. This species could potentially occur in the seasonal wetland habitat within the Project area. The nearest recorded observation of this species occurred approximately 2.5 miles west in 1999.

Species	Status*	Habitat	Occurrence Within the Project Site
Recurved Larkspur (<i>Delphinium recurvatum</i>)	CNPS 1B	Occurs in poorly drained, fine, alkaline soils in grassland and alkali scrub communities at elevations between 100 feet and 2,600 feet. Blooms March–June.	Absent. The Project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately eight miles east of the Project site in 1998.
San Joaquin Spearscale (<i>Extriplex joaquinana</i>)	CNPS 1B	Found in alkali wetlands, sinks, and scrublands in the San Joaquin Valley and Delta-Bay region of California. Associated with <i>Distichlis spicata</i> , <i>Frankenia</i> , and other scrub species at elevations below 1,150 feet. Blooms April – September.	Possible. The Project site contains suitable soil for this species. This species could potentially occur in the seasonal wetland habitat within the Project area. The nearest recorded observation of this species occurred approximately 3.5 miles north of the Project site in 2002.
Sanford’s Arrowhead (<i>Sagittaria sanfordii</i>)	CNPS 1B	Found in the San Joaquin Valley and other parts of California in freshwater-marsh, primarily ponds and ditches, at elevations below 1,000 feet. Blooms May–October.	Possible. There is suitable habitat for this species within the Project site. The nearest recorded observation of this species occurred approximately one mile north of the Project site in 1948.
Spiny-sepaed Button-celery (<i>Eryngium spinosepalum</i>)	CNPS 1B	Found in the foothills of the Sierra Nevada and the San Joaquin Valley. Occurs in vernal pools, swales, and roadside ditches. Often associated with clay soils in vernal pools within grassland communities. Occurs at elevations between approximately 50 feet and 4,200 feet. Blooms April–July.	Unlikely. The Project site lacks suitable vernal pool habitat for this species. The nearest recorded observation of this species occurred approximately 5.5 miles southwest of the Project site in 1948.
Subtle Orache (<i>Atriplex subtilis</i>)	CNPS 1B	Found in the San Joaquin Valley in saline depressions in alkaline soils within valley and foothill grassland communities at elevations below 330 feet. Blooms June–October.	Absent. The Project site lacks suitable habitat for this species. This species is not known to occur in this region of the San Joaquin Valley. The nearest recorded observation of this species occurred approximately 10 miles east of the Project site in 1936.
Vernal Pool Smallscale (<i>Atriplex persistens</i>)	CNPS 1B	Occurs in the Central Valley in alkaline vernal pools at elevations below 375 feet. Blooms June–September.	Absent. The Project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately three miles north of the Project site in 2011.
Wright’s Trichocoronis (<i>Trichocoronis wrightii</i> var. <i>wrightii</i>)	CNPS 2B	Found in marshes and swamps, riparian forest, meadows and seeps, vernal pools, mud flats of vernal lakes, drying riverbeds, and alkali meadows at elevations between approximately 15 feet and 1,450 feet. Blooms May - September.	Possible. Suitable habitat for this species is present at the Project site. This species could occur in the seasonal wetland habitat. The nearest recorded observation of this species occurred approximately 1.5 miles east of the Project site in 2017.

***EXPLANATION OF OCCURRENCE DESIGNATIONS AND STATUS CODES**

Present:	Species observed on the Project site at time of field surveys or during recent past.
Likely:	Species not observed on the Project site, but it may reasonably be expected to occur there on a regular basis.
Possible:	Species not observed on the Project site, but it could occur there from time to time.
Unlikely:	Species not observed on the Project site, and would not be expected to occur there except, perhaps, as a transient.
Absent:	Species not observed on the Project site and precluded from occurring there due to absence of suitable habitat.

STATUS CODES

FE	Federally Endangered	CE	California Endangered
FT	Federally Threatened	CCE	California Endangered (Candidate)
FC	Federal Candidate	CT	California Threatened
		CFP	California Fully Protected
		CSSC	California Species of Special Concern

CNPS LISTING

1B	Plants rare, threatened, or endangered in California and elsewhere.	2B	Plants rare, threatened, or endangered in California, but more common elsewhere.
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4.4.2 Applicable Regulations

Threatened and Endangered Species

Permits may be required from the California Department of Fish and Wildlife (CDFW) and/or the United States Fish and Wildlife Service (USFWS) if activities associated with a project have the potential to result in the “take” of a species listed as threatened or endangered under the California Endangered Species Act (CESA) and/or Endangered Species Act (ESA), respectively. Take is defined by CESA as, “to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill” (California Fish and Game Code, Section 86). Take is more broadly defined by the ESA to include “harm” (16 United States Code (USC), Section 1532(19), 50 Code of Federal Regulations, Section 17.3). CDFW and USFWS are responsible agencies under CEQA. Both agencies review CEQA documents in order to determine the adequacy of the treatment of endangered species issues and to make project-specific recommendations for their conservation.

Designated Critical Habitat

When species are listed as threatened or endangered, the USFWS often designates areas of “critical habitat” as defined by section 3(5)(A) of the ESA. Critical habitat is a term defined in the ESA as a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat is a tool that supports the continued conservation of imperiled species by guiding cooperation with the federal government. Designations only affect federal agency actions or federally funded or permitted activities. Critical habitat does not prevent activities that occur within the designated area. Only activities that involve a federal permit, license, or funding and are likely to destroy or adversely modify critical habitat will be affected.

Migratory Birds

The Migratory Bird Treaty Act (MBTA: 16 United States Code (USC) 703-712) prohibits killing, possessing, or trading in any bird species covered in one of four international conventions to which the United States is a party, except in accordance with regulations prescribed by the Secretary of the Interior. The name of the act is misleading, as it covers almost all bird’s native to the United States, even those that are non-migratory. The MBTA encompasses whole birds, parts of birds, and bird nests and eggs. Additionally, California Fish and Game Code makes it unlawful to take or possess any non-game birds covered by the MBTA (Section 3513), as well as any other native non-game birds (Section 3800).

Birds of Prey

Birds of prey are protected in California under provisions of California Fish and Game Code (Section 3503.5), which states that it is unlawful to take, possess, or destroy any birds in the order Falconiformes (hawks and eagles) or Strigiformes (owls), as well as their nests and eggs. The bald eagle and golden eagle are afforded additional protection under the Bald and Golden Eagle Protection Act (16 USC 668), which makes it unlawful to kill birds or their eggs, or take feathers or nests, without a permit issued by the U.S. Secretary of the Interior.

Nesting Birds

In California, protection is afforded to the nests and eggs of all birds. California Fish and Game Code (Section 3503) states that it is “unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided by this code or any regulation adopted pursuant thereto.” Breeding-season disturbance that causes nest abandonment and/or loss of reproductive effort is considered a form of “take” by the CDFW.

Wetlands and other “Jurisdictional Waters”

The United States Army Corp of Engineers (USACE) regulates the filling or grading in waters of the United States under the authority of Section 404 of the Clean Water Act (CWA). The definition of “waters of the United States” often changes from one presidential administration to the next based on the interpretation of the language in the CWA. Drainage channels, tributary waters, and adjacent wetlands may be considered “waters of the United States” or “jurisdictional waters” subject to the jurisdiction of the USACE if they satisfy the relatively permanent standard and the significant nexus standard. The current definition, established under the Biden Administration, became effective on March 20, 2023 (i.e., “new rule”), and uses the same longstanding categories of jurisdiction as the Pre-2015 definition. Currently, 23 states, including California, observe the new rule. As of May 10, 2023, ongoing litigation over the interpretation of the “waters of the United States” definition has kept the Pre-2015 Rule in place in 27 states.

Jurisdictional waters of the new rule include the following categories:

- (a)(1) Traditional Navigable Waters - all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- (a)(1) Territorial Seas
- (a)(1) Interstate Waters - waters including lakes, streams, or wetlands that cross or form part of state boundaries;
- (a)(2) Impoundments - impounded waters created in or from “waters of the United States;”
- (a)(3) Tributaries - waters that ultimately flow into traditional navigable waters, territorial seas, interstate waters or (a)(2) impoundments. Tributaries are jurisdictional if they meet either the relatively permanent standard or significant nexus standard;
- (a)(4) Adjacent Wetlands - wetlands adjacent to (a)(1) waters; wetlands adjacent to and with a continuous surface connection to relatively permanent (a)(2) impoundments or relatively permanent jurisdictional tributaries; or wetlands adjacent to (a)(2) impoundments or jurisdictional tributaries when the wetlands meet the significant nexus standard;
- (a)(5) All other waters such as intrastate lakes and ponds, streams or wetlands not defined in (a)(1) -(a)(4) above that meet either the relatively permanent standard or the significant nexus standard.

Familiar and longstanding exclusions have been consolidated under the new rule, which excludes from jurisdiction any feature that satisfies the following terms:

- Waste treatment systems, including treatment ponds or lagoons;
- Prior converted cropland;
- Ditches excavated wholly in and draining only dry land and do not carry a relatively permanent flow of water;
- Artificially irrigated areas that would revert to dry land if irrigation ceased;
- Artificial lakes or ponds created by excavating or diking dry land for the use of stock watering, irrigation, settling basins or rice growing;
- Artificial reflecting or swimming pools;
- Waterfilled depressions created in dry land; and
- Swales and erosional features (ex. gullies and small washes) characterized by low volume, infrequent, or short duration flow.

The new rule has incorporated the best available science, relevant supreme court cases, public comment, technical expertise, and experience gained from more than 45 years of implementing the Pre-2015 “waters of the United States” framework to inform jurisdictional limits. One significant court case involves the United States Supreme Court in its 2001 *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers* decision. It was determined that channels and wetlands isolated from other jurisdictional waters cannot be considered jurisdictional on the basis of their use, hypothetical or observed, by migratory birds. Similarly, in its 2006 consolidated *Carabell/Rapanos* decision, the United States Supreme Court ruled that a significant nexus between a wetland and other navigable waters must exist for the wetland itself to be considered a navigable, and therefore, jurisdictional water. The United States Supreme Court is hearing *Sackett v. USEPA* in May 2023, to determine governing standards of a significant nexus between waters of the United States and adjacent wetlands. The argument asserts that an adjacent wetland would be protected under the CWA only if it maintained a continuous surface water connection with a federal water body. This single decision would deny protection for networks of wetlands connected to navigable waters through subsurface flow. The final decision is anticipated for October 2023.

The extent of USACE jurisdiction within drainage channels is defined by “ordinary high-water marks” on opposing channel banks. All activities that involve the discharge of dredge or fill material into waters of the United States are subject to the permit requirements of the USACE. Such permits are typically issued on the condition that the applicant agrees to provide mitigation that results in no net loss of wetland functions or values. No permit can be issued until the RWQCB issues a Section 401 Water Quality Certification (or waiver of such certification) verifying that the proposed activity will meet state water quality standards.

Under the Porter-Cologne Water Quality Control Act of 1969, the State Water Resources Control Board (SWRCB) has regulatory authority to protect the water quality of all surface water and groundwater in the state of California (“waters of the state”). Nine Regional Water Quality Control Boards (RWQCB) oversee water quality at the local and regional level. The RWQCB for a given region regulates discharges of fill or pollutants into waters of the state through the issuance of various permits and orders. Discharges into waters of the state that are also waters of the United States require a Section 401 Water Quality Certification from the RWQCB as a prerequisite to obtaining certain federal permits, such as a Section 404 Clean Water Act permit. Discharges into all waters of the state, even those that are not also waters of the United States, require Waste Discharge Requirements (WDR), or waivers of WDRs, from the RWQCB. The RWQCB also administers the Construction Storm Water Program and the federal National Pollution Discharge Elimination System (NPDES) program. Projects that disturb one acre or more of soil must obtain

a Construction General Permit under the Construction Storm Water Program. A prerequisite for this permit is the development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer. Projects that discharge wastewater, storm water, or other pollutants into a water of the United States may require a NPDES permit.

CDFW has jurisdiction over the bed and bank of natural drainages and lakes according to provisions of Section 1601 and 1602 of the California Fish and Game Code. Activities that may substantially modify such waters through the diversion or obstruction of their natural flow, change or use of any material from their bed or bank, or the deposition of debris require a notification of a Lake or Streambed Alteration. If CDFW determines that the activity may adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared. Such an agreement typically stipulates that certain measures will be implemented to protect the habitat values of the lake or drainage in question.

Merced County General Plan

The Merced County General Plan Policy Document contain the following goals and policies related to the Project:

Biological Resources

Policy NR-1.1: Habitat Protection

Identify areas that have significant long-term habitat and wetland values including riparian corridors, wetlands, grasslands, rivers and waterways, oak woodlands, vernal pools, and wildlife movement and migration corridors, and provide information to landowners.

Policy NR-1.2: Protected Natural Lands

Identify and support methods to increase the acreage of protected natural lands and special habitats, including but not limited to, wetlands, grasslands, vernal pools, and wildlife movement and migration corridors, potentially through the use of conservation easements.

Policy NR-1.5: Wetland and Riparian Habitat Buffer

Identify wetlands and riparian habitat areas and designate a buffer zone around each area sufficient to protect them from degradation, encroachment, or loss.

Water Supply

Policy W-1.4: Groundwater Recharge Projects

Support implementation of groundwater recharge projects consistent with adopted Integrated Regional Water Management Plans to minimize overdraft of groundwater and ensure the long-term availability of groundwater.

Policy W-1.5: New Well Guidelines

Support implementation of groundwater recharge projects consistent with adopted Integrated Regional Water Management Plans to minimize overdraft of groundwater and ensure the long-term availability of groundwater.

Water Quality

Policy W-2.1: Water Resource Protection

Ensure that land uses and development on or near water resources will not impair the quality or productive capacity of these water resources.

Policy W-2.2: Development Regulations to Protect Water Quality

Prepare updated development regulations, such as best management practices, that prevent adverse effects on water resources from construction and development activities.

Policy W-2.6: Wellhead Protection Program

Enforce the wellhead protection program to protect the quality of existing and future groundwater supplies by monitoring the construction, deepening, and destruction of all wells within the County.

Water Reuse and Conservation

Policy W-3.3: Water System Rehabilitation

Encourage the rehabilitation of irrigation systems and other water delivery systems to reduce lost water and increase the efficient use and availability of water.

Policy W-3.14: Agricultural Water Conservation

Encourage farmers to use irrigation methods which conserve water in areas where flood irrigation is used for groundwater recharge.

4.4.3 Impact Analysis

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

Less than Significant Impact with Mitigation Incorporated. Of the 30 regionally occurring special status animal species, 20 are considered absent from or unlikely to occur within the Project area due to past or ongoing disturbance and/or the absence of suitable habitat. These species include: American badger, blunt-nosed leopard lizard, burrowing owl, California tiger salamander, coast horned lizard, conservancy fairy shrimp, Crotch bumble bee, Fresno kangaroo rat, giant gartersnake, green sturgeon, hardhead, longhorn fairy shrimp, monarch butterfly, northern leopard frog, Northern California legless lizard, pallid bat, San Joaquin kit fox, steelhead, valley elderberry longhorn shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, western red bat, and yellow rail. Since it is unlikely that these species would occur onsite, implementation of the Project should have no impact on these 20 special status species through construction mortality, disturbance, or loss of habitat. Mitigation measures are not warranted for these species.

Of the 21 regionally occurring rare plant species, 10 are considered absent from or unlikely to occur within the Project area due to past or ongoing disturbance and/or the absence of suitable habitat. These species include: brittlescale, California alkali grass, Colusa grass, Coulter's goldfields, lesser saltscare, northern slender pondweed, recurved larkspur, spiny-sealed button-celery, subtle orache, and vernal

pool smallscale. Since it is unlikely that these species would occur onsite, implementation of the Project should have no impact on these 10 special status species through construction mortality, disturbance, or loss of habitat. Mitigation measures are not warranted for these species.

Species protected by California Fish and Game Code, CDFW, USFWS, or CEQA that have the potential to be impacted by Project activities include: golden eagle, green sturgeon and steelhead, migratory nesting birds, raptors, and special status birds (i.e., loggerhead shrike, northern harrier, Swainson's hawk, and tricolored blackbird), western pond turtle and western spadefoot, and various rare plants. Discussion and corresponding mitigation measures are provided below.

Project-Related Mortality and/or Nest Abandonment of Migratory Birds, Raptors, and Special Status Birds

The Project area contains suitable nesting and foraging habitat for a variety of protected bird species, such as migratory birds, raptors, and special status birds (i.e., loggerhead shrike, northern harrier, Swainson's hawk, and tricolored blackbird). It is anticipated that during the nesting bird season, protected birds could nest on the ground, in emergent aquatic vegetation, shrubs, trees, or structures within the Project area and forage within the Project area. Protected birds located within or adjacent to the Project area during construction have the potential to be injured or killed by Project-related activities. In addition to the direct "take" of protected birds within the Project area or adjacent areas, these birds nesting in these areas could be disturbed by Project-related activities resulting in nest abandonment. Projects that adversely affect the nesting success of protected birds or result in the mortality of these birds would be a violation of state and federal laws and considered a potentially significant impact under CEQA.

While foraging habitat for protected birds is present on the site, suitable foraging habitat is located adjacent to the site and within the vicinity of the site. Loss of the foraging habitat from implementation of the Project is not considered a significant impact.

Mitigation measures are warranted and are identified in [Section 4.4.4](#) below. Implementation of mitigation measures **BIO-1**, **BIO-2** and **BIO-3** will reduce potential impacts to migratory birds, raptors, and special status birds to a less than significant level under CEQA and ensure compliance with federal laws protecting these species.

Project-Related Mortality and/or Disturbance of Western Pond Turtle and Western Spadefoot

The Project area contains suitable habitat for western pond turtle and western spadefoot. Projects that result in the take of these species would be a violation of state and federal laws and considered a potentially significant impact under CEQA.

Mitigation measures are warranted and are identified in [Section 4.4.4](#) below. Implementation of mitigation measures **BIO-4**, **BIO-5**, and **BIO-6** will reduce potential impacts to western pond turtle and western spadefoot to a less than significant level under CEQA.

Project-Related Impacts to Rare Plant Species

The following rare plant species were identified to potentially occur within or adjacent to the Project area: alkali milk-vetch, alkali-sink goldfields, delta button-celery, heartscale, Heckard's pepper-grass, hispid salty bird's-beak, Hoover's spurge, prostrate vernal pool navarretia, San Joaquin spearscale, Sanford's arrowhead, and Wright's trichocoronis. Projects that adversely impact these species or result

in the mortality of these species would be considered a significant impact under CEQA and may be a violation of state and/or federal laws.

Mitigation measures are warranted and are identified in [Section 4.4.4](#) below. Implementation of mitigation measures **BIO-7**, **BIO-8**, and **BIO-9** will reduce potential impacts to these rare plants to a less than significant level under CEQA and ensure compliance with federal laws protecting these species.

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

Less than Significant Impact with Mitigation Incorporated. Riparian habitat is present along Mariposa Slough within the riverine and seasonal wetland habitats of the Project site. Riparian vegetation is protected by the California Fish and Game Code. Temporary impacts to seasonal riparian vegetation (i.e., broadleaf cattail and hardstem bulrush) would not be considered a significant impact because these species would grow back. Permanent impacts to seasonal and year-round (i.e., willow trees) riparian vegetation would be a violation of state law and considered a significant impact under CEQA.

Mitigation measures are warranted and are identified in [Section 4.4.4](#) below. Implementation of mitigation measures **BIO-10** and **BIO-11** will reduce potential impacts to riparian habitat to a less than significant level under CEQA and ensure compliance with federal laws protecting this resource.

- c) Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Less than Significant Impact with Mitigation Incorporated. Mariposa Slough is potentially considered to be a water of the United States and a water of the state and runs through the Project area. Project-related impacts to these waters would be considered potentially significant under CEQA. Impacts to waters of the United States are also subject to the permit requirements of Section 404 and 401 of the CWA. The placement of fill within any wetlands or other jurisdictional features will require 1) a 404 permit from the USACE, and 2) a 401 Water Quality Certification from the RWQCB, and likely also 3) a Streambed Alteration Agreement from CDFW.

Mitigation measures are warranted and are identified in [Section 4.4.4](#) below. Implementation of mitigation measures **BIO-12**, **BIO-13**, and **BIO-14** will reduce potential impacts to jurisdictional waters to a less than significant level under CEQA and ensure compliance with federal laws protecting this resource.

- 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?

Less than Significant Impact. The Project area does contain features that would be likely to function as wildlife movement corridors. The surrounding area consists mostly of agricultural fields, and Mariposa Slough would provide additional cover for wildlife and may serve as a direct route of travel between more suitable habitats. However, wildlife would likely be able to continue to use the Mariposa Slough as a wildlife movement corridor during construction, and full function of the corridor would return after construction is completed. Mitigation is not warranted.

There are no native wildlife nursery sites within the Project area. Mitigation is not warranted.

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

No Impact. There would be no impact because the Project does not conflict with any local policies or ordinances protecting biological resources.

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?

No Impact. There would be no impact because the Project appears to be consistent with the goals and policies of the Merced County General Plan. There are no known Habitat Conservation Plans or Natural Community Conservation Plans in the Project vicinity.

4.4.4 Mitigation

Migratory Birds, Raptors, and Special Status Birds

BIO-1 **(Avoidance):** The Project's construction activities will occur, if feasible, between September 16 and January 31 (outside of the nesting bird season) to avoid impacts to nesting birds.

BIO-2 **(Pre-construction Surveys):** If activities must occur within nesting bird season (February 1 to September 15), a qualified biologist will conduct a pre-construction survey for Swainson's hawk nests onsite and up to a 0.5-mile radius within five calendar days prior to the start of construction. The Swainson's hawk survey will not be completed between April 21 to June 10 due to the difficulty of identifying nests during this time of year. The survey would also include inspecting for nesting migratory birds within up to 100 feet outside of the Project area and for other nesting raptors within up to 500 feet outside of the Project area. All raptor nests would be considered "active" upon the nest-building stage. If no active nests are observed, no further mitigation is required.

BIO-3 **(Avoidance Buffers):** On discovery of any active nests or breeding colonies near work areas, a qualified biologist will determine appropriate avoidance buffer distances based on applicable CDFW and/or USFWS guidelines, the biology of the species, conditions of the nest(s), and the level of Project disturbance.

Western Pond Turtle and Western Spadefoot

BIO-4 **(Pre-construction Survey):** A qualified biologist would complete a preconstruction survey for western pond turtle and western spadefoot within 3 calendar days of the start of construction activities.

BIO-5 **(Avoidance):** If any western pond turtles or western spadefoot are observed in the Project area, they should be allowed to leave the site of their volition.

- BIO-6** **(Relocation):** If avoidance is not feasible, a qualified biologist would relocate the animal out of harm's way. The biologist should take into consideration the biology of the species in question when choosing where to relocate the animal to.

Rare Plant Species

- BIO-7** **(Rare Plant Surveys):** A qualified botanist/biologist will conduct focused rare plant surveys during the appropriate blooming seasons for alkali milk-vetch, alkali-sink goldfields, delta button-celery, heartscale, Heckard's pepper-grass, hispid salty bird's-beak, Hoover's spurge, prostrate vernal pool navarretia, San Joaquin spearscale, Sanford's arrowhead, and Wright's trichocoronis, according to CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (2018) for areas where ground disturbance will occur and prior to the start of construction.
- BIO-8** **(Avoidance):** If rare plants are identified, an avoidance buffer and, if necessary, use of exclusion fencing, will be placed around the area so as not to disturb the plants or their root system.
- BIO-9** **(Relocation Plan):** If rare plant individuals or populations are identified within Project work areas, and the plants cannot be avoided, a relocation plan will be prepared and approved by the appropriate agencies.

Riparian Habitat

- BIO-10** **(Avoidance):** Permanent impacts to riparian habitat will be avoided.
- BIO-11** **(Agreement):** Should permanent impacts to riparian habitat be required a CDFW Streamed Alteration Agreement will be obtained, as described in BIO-14.

Regulated Waters

- BIO-12** **(Delineation):** Once Project activities are determined, an aquatic resources delineation will be prepared for the Project area, to determine the boundaries of all potentially jurisdictional waters present.
- BIO-13** **(Minimization):** Based on the results of the aquatic resources delineation, the Project will be designed to minimize impacts to potentially jurisdictional waters to the maximum extent practicable while still achieving the goal of the Project.
- (Permits):** If the final Project design requires impacts to areas of jurisdictional waters, permits under Section 404 and 401 of the Clean Water Act and a CDFW Streambed Alteration Agreement will be obtained for the Project, and the Project will adhere to all conditions of the permits, such as compensatory mitigation requirements, survey requirements, monitoring requirements, timing requirements and reporting requirements.

4.5 CULTURAL RESOURCES

Table 4-10: Cultural Resources Impacts

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

4.5.1 Baseline Conditions

The Project area is located in Merced County to the east of the San Joaquin River between the Merced River on the north and Chowchilla River on the south. Numerous sloughs and drainages cross the Project Area, most notably, Mariposa Slough. According to the Rosenthal and Meyer (2004) model, the potential for buried archaeological deposits in the Project area is primarily classified as Moderate for Early to Middle Holocene (7,000-4,000 years before present (YBP)) in the central and eastern portions, while the potential in the western portion, closer to the San Joaquin River, can be classified as High for containing Middle to Late Holocene (4,000-2,000 YBP) archaeological deposits.

Records Search

In order to determine whether the Area of Potential Effect (APE) had been previously surveyed for cultural resources, and/or whether any such resources were known to exist on any of them, a records search of site files and maps was conducted by the Central California Information Center (CCIC), California State University, Stanislaus on June 5, 2023. The records search was completed to determine: (i) if prehistoric or historical archaeological sites had previously been recorded within the study areas; (ii) if the Project area had been systematically surveyed by archaeologists prior to the initiation of this field study; and/or (iii) whether the region of the field Project was known to contain archaeological sites and to thereby be archaeologically sensitive. Records examined included archaeological site files and maps, the National Register of Historic Places (NRHP), Historic Property Data File, California Inventory of Historic Resources, and the California Points of Historic Interest.

According to the CCIC, six previous surveys had been completed within the APE, and one previously recorded resource was known to exist within it. An additional 9 surveys had been previously completed within a half mile radius of the APE, and 8 previously recorded resources had been recorded within that same radius. The one previously recorded resource found in the APE is Siphon Ditch.

Historical USGS topographical quadrangles and aerial photographs, extending back to 1918 and 1946, respectively, were examined to identify historical use or development of the Project APE. The Turner Ranch, CA 1918 (HTMC, 1918 ed.) 1:31,680 quadrangle shows modern day Sand Slough Road as a linear earthwork, possibly a levee, and Mariposa Slough is already charted by that time with no other significant development

in the immediate area. By the mid-20th century, Sand Slough Road appears as a dirt road, Siphon Ditch appears in its historic alignment, and portions of Mariposa Slough appear channelized as seen in the Turner Ranch, CA 1948 (HTMC, 1948 ed.) 1:24,000 quadrangle. By the 1960s, the existing airstrip located south of the Project APE and the Mariposa Bypass conveyance structure to the north are both established as seen in the Turner Ranch, CA 1961 (HTMC, 1962 ed.) 1:24,000 quadrangle. A series of dirt roads surrounding and bisecting the APE also appear by this time. Historic aerial photography from 1998 suggests that Siphon Ditch was realigned to its current course by that time.

Native American Outreach

The Native American Heritage Commission (NAHC) in Sacramento was also contacted in June 2023. They were provided with a brief description of the Project and a map showing its location and requested that the NAHC perform a search of the Sacred Lands File to determine if any Native American resources have been recorded in the immediate APE. The NAHC identifies, catalogs, and protects Native American cultural resources -- ancient places of special religious or social significance to Native Americans and known ancient graves and cemeteries of Native Americans on private and public lands in California. The NAHC is also charged with ensuring California Native American tribes' accessibility to ancient Native American cultural resources on public lands, overseeing the treatment and disposition of inadvertently discovered Native American human remains and burial items, and administering the California Native American Graves Protection and Repatriation Act, among many other powers and duties. ASM Affiliates (ASM), a cultural resource management firm, sent out letters and emails to tribal organizations on the NAHC contact list to determine whether any organization wished to consult under AB 52. One response was received from Elizabeth Kipp, Chairperson, for the Big Sandy Rancheria of Western Mono Indians, stating that they have no comments or concerns about the Project. No additional responses were received from the provided list of tribes.

4.5.2 Impact Analysis

- a) Would the project cause a substantial adverse change in the significance of a historical resource pursuant to in § 15064.5?
- b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?

Less than Significant Impact with Mitigation Incorporated. A records search was conducted at the Central California Information Center, California State University, Stanislaus. The results indicated that six previous surveys had been completed within the APE, and one previously recorded resource (Siphon Ditch) was known to exist within it. An additional nine previous surveys had been completed within a half mile radius of the APE, and eight previously recorded resources had been recorded within that same radius. An intensive Phase I survey/Class III inventory report was prepared for the Project ([Appendix C](#)). A pedestrian survey took place in June 2023 and covered 180 acres. Since the time of the June 2023 survey, the APE has been reduced to 99 acres. While the overall acreage of the APE decrease significantly, additional areas needed to be surveyed that were not included in the original survey. The additional areas account for the two proposed well locations. In June 2024, another survey took place to reflect the updated APE. The total area surveyed for cultural resources was 182.8 acres. During the preparation of the Phase I survey/Class III inventory, ASM identified and updated a short segment of the previously recorded Siphon Ditch, a mid-twentieth century irrigation ditch. The segment of Siphon Ditch within the APE was constructed in the mid-20th century and realigned in the 1990s. In 2010, Applied Earthworks,

Inc. evaluated Siphon Ditch for eligibility to the NRHP/California Register of Historical Resources and found the resource not eligible for inclusion under any criteria. ASM concurs with these findings.

Through the Phase I survey/Class III inventory, ASM did not identify any cultural resources within the APE. Though uncovering cultural resources during construction activities is unlikely, given the presence of prehistoric archaeological sites in the vicinity of the APE, implementation of mitigation measure **CUL-1** and **CUL-2** outlined below will reduce impacts to less than significant.

c) Would the project disturb any human remains, including those interred outside of dedicated cemeteries?

Less than Significant Impact with Mitigation Incorporated. There is no evidence or record that the Project has the potential to be an unknown burial site, or the site of buried human remains. However, in the unlikely event of such a discovery, mitigation shall be implemented. With incorporation of mitigation measure **CUL-3** outlined below, impacts resulting from the discovery of remains interred on the Project site would be less than significant.

4.5.3 Mitigation

- | | |
|--------------|--|
| CUL-1 | All construction personnel shall take a Cultural Resources Sensitivity Awareness Training given by a qualified archaeologist in order to become familiar with the types of cultural artifacts that exist within the vicinity of the APE and could potentially be uncovered. |
| CUL-2 | In the unlikely event that cultural resources are identified during construction, it is recommended that all work be stopped within 100-ft of the discovery and a qualified archaeologist be called out to evaluate the find. |
| CUL-3 | In the event that any human remains are discovered on the Project site, the Merced County Coroner must be notified of the discovery (California Health and Safety Code, Section 7050.5) and all activities in the immediate area of the find or in any nearby area reasonably suspected to overlie adjacent human remains must cease until appropriate and lawful measures have been implemented. If the Coroner determines that the remains are not recent, but rather of Native American origin, the Coroner shall notify the Native American Heritage Commission (NAHC) in Sacramento within 24 hours to permit the NAHC to determine the Most Likely Descendent of the deceased Native American. |

4.6 ENERGY

Table 4-11: Energy Impacts

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☐	☒	☐

4.6.1 Baseline Conditions

Pacific Gas and Electric (PG&E) supplies electricity to the Project area. PG&E obtains its power through hydroelectric, natural gas, and eligible renewable sources. PG&E continually produces new electric generation and natural gas sources and implements continuous improvements to gas lines throughout its service areas to ensure the provision of services to residents. New construction would be subject to Title 20 and 24 of the California Code of Regulations which each serve to reduce demand for electrical energy by implementing energy-efficient standards for residential and non-residential buildings. As the Project does not involve buildings of any kind, these regulations are not applicable.

4.6.2 Impact Analysis

- a) Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?
- b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

a and b) Less than Significant Impact. Construction is anticipated to consume gasoline for worker trips and diesel from on-site construction equipment. California Code of Regulations Title 13, Motor Vehicles, Section 2449(d)(2) limits idling times of construction vehicles to no more than five minutes, thereby precluding unnecessary and wasteful consumption of fuel because of unproductive idling of construction equipment. In addition, the energy consumption for construction activities would not be ongoing as they would be limited to construction of the Project. Therefore, construction energy impacts would be less than significant.

4.7 GEOLOGY AND SOILS

Table 4-12: Geology and Soils Impacts

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? 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 waste water 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 geological feature?	☐	☒	☐	☐

4.7.1 Baseline Conditions

Geology and Soils

The Project is located within the Great Valley geomorphic province, one of 11 major provinces in California.² The California provinces are “naturally defined geologic regions” that exhibit distinct and unique features based on geology, faults, topographic relief, and climate.³ The Great Valley is an alluvial plain that stretches about 400 miles long and 50 miles wide. The northern part of the Great Valley province is the Sacramento

² (California Department of Conservation 2002)

³ Ibid.

Valley drained by the Sacramento River, and its southern portion is the San Joaquin Valley drained by the San Joaquin River. Sediment found in the Great Valley have been, and continue to be, deposited since the Jurassic period, which was roughly 160 million years ago.⁴

Faults and Seismicity

As part of compliance with the Alquist-Priolo Act, the State Geologist published a list of counties, cities, and state agencies that are affected by Alquist-Priolo Fault Zones. The County of Merced appears on this list, but the Project site is not located in the area of the County that is affected by Alquist Priolo Fault Zones. The nearest Alquist-Priolo earthquake fault zone, the Ortigalita Fault Zone, is located approximately 23 miles southwest of the Project area.⁵

Liquefaction

Liquefaction is a process that occurs during earthquakes when the soils behave like quicksand. Significant damage to structures can result when buildings sink into the liquefied soil. Liquefaction potential is determined from a variety of factors, including soil type, soil density, depth to the groundwater table, and the duration and intensity of ground shaking. Liquefaction is most likely to occur in deposits of water-saturated alluvium or areas of considerable artificial fill. Areas most prone to liquefaction are those which are water-saturated (specifically where the water table is less than 30 feet below the surface) and consist of relatively uniform sands that are of loose to medium density. Although there are areas within the City where the water table is 30 feet or less below the surface, soil types in the area are not conducive to liquefaction because they are either too coarse in texture or too high in clay content. Liquefaction potential at the Project area is considered low.⁶

Soil Subsidence

There are two types of Subsidence: Land subsidence and hydrocompaction subsidence. Hydrocompaction subsidence occurs when a large land area settles due to over-saturation. These areas are typically composed of open-textured soils that become saturated, high in silt or clay content. Land subsidence occurs when an extensive amount of ground water, oil, or natural gas is withdrawn from below the ground surface. The Project is located within the Merced Subbasin of the San Joaquin Valley Basin. In conjunction with recent years of drought, pumping groundwater has caused ground subsidence in the basin vicinity.⁷

Dam and Levee Failure

Dam and Levee failure has potential for catastrophic damage to communities and lands within its vicinity. There are no dam or levees in the nearby vicinity of the Project; however, the inundation zone of Yosemite Lake is 1.25 miles northeast. Yosemite Lake is located 19 miles from the Project site to the northeast.⁸

⁴ Ibid.

⁵ (California Department of Conservation 2022)

⁶ Ibid.

⁷ (Merced County 2013)

⁸ (California Department of Water Resources 2022)

4.7.2 Impact Analysis

a) Would the project 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?

a-i – a-iii) Less than Significant Impact. The Project area does not lie within the Alquist-Priolo Earthquake Fault Zone. The nearest Alquist Priolo earthquake fault zone, the Ortigalita Fault, is located approximately 23 miles from the Project. According to the Merced County General Plan, the Ortigalita Fault is the principal source of potential seismic activity within Merced County, and the Project area may be subject to moderate seismic impacts as a result of ground shaking.⁹ The potential for geologic hazards to cause substantial adverse effects due to ground shaking and liquefaction would be addressed through mandatory compliance with the California Building Code (CBC) seismic design provisions. The CBC incorporates the latest seismic design standards for structural loads and materials, as well as provisions from the National Earthquake Hazards Reduction Program, to mitigate losses from an earthquake and provide the latest provisions to ensure earthquake safety. The earthquake design requirements of the CBC consider the occupancy category of the structure, site class, soil classifications, and various seismic coefficients. The CBC provides standards for various aspects of construction, including but not limited to excavation, grading, earthwork, construction, site preparation, fill placement, retaining wall design, and foundation design. While the Project may be susceptible to some seismic-related hazards, the Project would be required to minimize this risk, to the extent feasible, through incorporation of applicable CBC standards. Therefore, with conformance to the CBC, impacts involving the potential for fault rupture, ground shaking, or liquefaction to result in substantial adverse effects would be less than significant.

- iv. Landslides?

No Impact. The Project area exhibits a flat topography which is not susceptible to landslides. The surrounding landscape is comprised of flat, agricultural land which is also not conducive to conditions which would induce landslides. The elevation change between the base of the Mariposa Slough and the top of the channel is only a few feet. Therefore, the Project would not expose people or structures to potential substantial adverse effects involving landslides. There would be no impact.

b) Would the project result in substantial soil erosion or the loss of topsoil?

Less than Significant Impact. Earthmoving activities associated with the Project would include excavation for basin construction, shallow well drilling, and adding additional features to existing culverts. These activities could expose soils to erosion processes and the extent of erosion would vary depending on slope steepness/stability, vegetation/cover, concentration of runoff, and weather conditions. Construction of the recharge basins, due to their size, would require the contractor to obtain coverage

⁹ (Merced County 2013)

under the General Permit for Discharges of Storm Water Associated with Construction Activity Construction General Permit (CGP) Order 2009-0009-DWQ. Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The CGP requires the development of a SWPPP by a certified Qualified SWPPP Developer. Construction impact areas for the shallow wells would be individually less than one acre in size; therefore, would be required to comply with local ordinance. The Merced County Stormwater Management Program requires the Project to comply with Construction Site Storm Water Runoff Control best management practices (BMP). These BMPs can be found in the Merced County Stormwater Management Plan.¹⁰ With implementation of these BMPs, impacts would be less than significant.

- c) Would the project 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?

Less than Significant Impact. The Project would include the construction of two recharge basins, two shallow groundwater wells, and supporting infrastructure to existing culverts at road crossings at the Mariposa Slough. Although the Project could be exposed to seismic hazards, the Project is not anticipated to adversely affect soil stability or increase the potential for local or regional landslides, subsidence, liquefaction, or collapse. As discussed previously, the Project site is in an area that is not reasonably assumed to contain conditions conducive to liquefaction hazards.¹¹ The Project site is flat and thus there is no potential for landslides to occur. Therefore, the Project would not exacerbate hazards related to unstable soil and would not result in on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse. Impacts would be less than significant.

- d) Would the project 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?

Less than Significant Impact. Expansive soils, soils that shrink and swell as a result of moisture changes, typically exhibit a high percentage of clay in their overall composition. Eight soil mapping units representing four soil types were identified within the Project site and can be found in **Appendix B**. Some of the soils within the Project area have a moderate to high shrink-swell potential. The shrinking/swelling of soils can adversely impact building structures, such as foundations and roads. However, standard BMPs would be implemented to minimize the potential for soil erosion during construction. Therefore, impacts would be less than significant.

- e) Would the project 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?

No Impact. Septic installation or alternative wastewater disposal systems are not necessary for the Project. Therefore, there would be no impact.

- f) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?

¹⁰ (Stantec 2007)

¹¹ (Merced County 2013)

Less than Significant Impact with Mitigation Incorporated. No known paleontological resources have been identified in the Project area. However, if a paleontological resource is found, then construction can result in a significant impact unless mitigated properly. **GEO-1** will be implemented in the unlikely event that paleontological resources are encountered during Project construction.

4.7.3 Mitigation

GEO-1 Should paleontological resources be encountered on the Project site, all ground disturbing activities in the area shall stop. A qualified paleontologist shall be contacted to assess the discovery. Mitigation may include monitoring, recording the fossil locality, data recovery and analysis, and a final report. Public educational outreach may also be appropriate. Upon completion of the assessment, a report documenting methods, findings, and recommendations shall be prepared and submitted to Merced County for review, and (if paleontological materials are recovered) a paleontological repository, such as the University of California Museum of Paleontology.

4.8 GREENHOUSE GAS EMISSIONS

Table 4-13: Greenhouse Gas Emissions Impacts

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☐	☒	☐

4.8.1 Baseline Conditions

The Earth's climate has been warming for the past century. Experts believe this warming trend is related to the release of certain gases into the atmosphere. Greenhouse gases (GHG) absorb infrared energy that would otherwise escape from the Earth. As the infrared energy is absorbed, the air surrounding the Earth is heated. An overall warming trend has been recorded since the late 19th century, with the most rapid warming occurring over the past 35 years, with 16 of the 17 warmest years on record occurring since 2001. Not only was 2016 the warmest year on record, but eight of the 12 months that make up the year—from January through September, with the exception of June—were the warmest on record for those respective months. October, November, and December of 2016 were the second warmest of those months on record—in all three cases, behind records set in 2015.¹² Human activities have been attributed to an increase in the atmospheric abundance of greenhouse gases. The following is a brief description of the most commonly recognized GHGs.

Greenhouse Gases

Carbon dioxide (CO₂) is an odorless, colorless natural greenhouse gas. CO₂ is emitted from natural and anthropogenic sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic out gassing. Anthropogenic sources include the burning of coal, oil, natural gas, and wood.

Methane (CH₄) is a flammable greenhouse gas. A natural source of methane is the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain methane, which is extracted for fuel. Other sources are from landfills, fermentation of manure, and ruminants such as cattle.

Nitrous oxide (N₂O), also known as laughing gas, is a colorless greenhouse gas. Nitrous oxide is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load.

¹² (National Aeronautics and Space Administration Warmest Year on Record 2017). Accessed September 2021.

Water vapor is the most abundant, and variable greenhouse gas. It is not considered a pollutant; in the atmosphere, it maintains a climate necessary for life.

Effects of Climate Change

The impacts of climate change have yet to fully manifest. A hotter planet is causing the sea level to rise, disease to spread to non-endemic areas, as well as more frequent and severe storms, heat events, and air pollution episodes. Also affected are agricultural production, the water supply, the sustainability of ecosystems, and therefore the economy. The magnitude of these impacts is unknown.

Emissions of GHGs contributing to global climate change are largely attributable to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. GHG emissions are typically expressed in carbon dioxide-equivalents, based on the GHG's Global Warming Potential (GWP). The GWP is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, one ton of CH₄ has the same contribution to the greenhouse effect as approximately 21 tons of CO₂. Therefore, CH₄ is a much more potent GHG than CO₂.

4.8.2 Methodology

The CalEEMod Emissions Model ([Appendix A](#)) was prepared in June 2023. The sections below detail the methodology of the report and its conclusions.

Short-Term Construction-Generated Emissions

Short-term construction emissions associated with the Project were calculated using the CalEEMod Emissions Model, Version 2022.1. Modeling assumptions and output files are included in [Appendix A](#).

Long-Term Operational Emissions

The Project does not include any operational changes. It is not anticipated that there would be additional long-term operational emissions associated with the Project.

Thresholds of Significance

The District has not adopted its own GHG thresholds or prepared a Climate Action Plan that can be used as a basis for determining project significance. In accordance with SJVAPCD's *CEQA Greenhouse Gas Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects*,¹³ projects complying with Best Performance Standards (BPS) would be determined to have a less-than-significant impact. The SJVAPCD does not have an adopted threshold for GHGs; however, the South Coast Air Quality Management District (SCAQMD) has set a threshold of 10,000 Metric Tons of Carbon Dioxide Equivalent (MTCO₂e).¹⁴ This threshold has been applied to this Project. Compliance with BPS and projects generating less than 10,000 MTCO₂e per year would result in less than significant impacts. In addition, project-generated emissions complying with an approved plan or mitigation program would also be determined to have a less-than-significant impact.

¹³ (San Joaquin Valley Air Pollution Control District. 2015. Final Guidance for Assessing and Mitigating Air Quality Impacts 2015)

¹⁴ (South Coast Air Quality Management District 2019)

4.8.3 Impact Analysis

- a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- b) Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

a and b) Less than Significant Impact. Total GHG emissions generated during all phases of construction were combined and are presented in **Table 4-14**. The SJVAPCD does not recommend assessing the significance of construction-related emissions. However, other jurisdictions, such as the SCAQMD, have concluded that construction emissions should be included since they may remain in the atmosphere for years after construction is complete. In order to account for the construction emissions, amortization of the total emissions generated during construction were based on the life of the development (nonresidential—30 years). As the emissions do not exceed this threshold, impacts are less than significant.

Table 4-14: Construction Emissions, Greenhouse Gases

	MTCO ₂ e
Total Construction Emissions	532
Amortized over 30 years	35.6
Notes: Calculation total use unrounded numbers from CalEEMod output. Source: Appendix A	

4.9 HAZARDS AND HAZARDOUS MATERIALS

Table 4-15: Hazards and Hazardous Materials Impacts

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

4.9.1 Baseline Conditions

Hazardous Materials

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies, and developers to comply with CEQA requirements in providing information about the location of hazardous materials release sites. Government Code Section 65962.5 requires the California Environmental Protection Agency to develop at least annually an updated Cortese List. The Department of Toxic Substances Control (DTSC) is responsible for a portion of the information contained in the Cortese List. Other State and local government agencies are required to provide additional hazardous material release information for the Cortese List. DTSC's EnviroStor database provides DTSC's component of Cortese

List data (DTSC, 2010). In addition to the EnviroStor database, the SWRCB GeoTracker database provides information on regulated hazardous waste facilities in California, including underground storage tank (UST) cases and non-UST cleanup programs, including Spills-Leaks-Investigations-Cleanups sites, Department of Defense sites, and Land Disposal program. A search of the DTSC EnviroStor database and the SWRCB GeoTracker performed on June 2, 2023 determined that there are no known active hazardous waste generators or hazardous material spill sites within the Project area.¹⁵

Airports

The Merced Regional Airport is the closest public airport to the Project, located approximately 11 miles northeast of the Project area.

Emergency Response Plan

The Merced County Department of Public Health coordinates the development and maintenance of the Merced County Medical-Health Emergency Operations Plan.¹⁶ This plan establishes policies and an emergency management organization and assigns roles and responsibilities to ensure the effective management of emergency operations. The plan also identifies sources of external support which might be provided through mutual aid and specific statutory authorities by other jurisdictions, State and federal agencies, and the private sector.

Sensitive Receptors

The Project is located in a rural area with no sensitive receptors within a two-mile radius.

4.9.2 Impact Analysis

- a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?
- b) Would the project 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?

a and b) Less than Significant Impact. There would be no transport, use, or disposal of hazardous materials associated with Project construction, with the exception of diesel fuel for construction equipment. Any potential accidental hazardous materials spills during Project construction is the responsibility of the contractor to remediate in accordance with industry BMPs and State and county regulations. Any impacts would therefore be less than significant.

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

No Impact. The Project would not be located within a quarter-mile of an existing or proposed school. Therefore, there would be no impact.

¹⁵ (California Department of Toxic Substances Control 2020); (State of California 2020)

¹⁶ [MERCED COUNTY EMERGENCY/DISASTER PLAN \(countyofmerced.com\)](https://www.countyofmerced.com/merced-county-emergency-disaster-plan)

- d) Would the project 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?

Less than Significant Impact. The Project would not involve land that is listed as an active hazardous materials site pursuant to Government Code Section 65962.5 and is not included on a list compiled by DTSC. Both the SWQCB's GeoTracker and DTSC's EnviroStor websites were queried on June 2, 2023, for contaminated groundwater or sites in the area with negative findings. Operation of the either the recharge basins or shallow groundwater wells would not involve the transport, use, or disposal of hazardous materials and the parcel proposed for the basins has not been identified as active hazardous waste generators or hazardous material spill sites. Facility operation would be consistent with that of the District's other similar basins in that groundwater conditions would be monitored to minimize negative impacts on the surrounding areas (such as nearby wells, crops, and septic systems). The impacts would be less than significant.

- 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?

No Impact. The Merced Regional Airport is located approximately 11 miles northeast of the Project area. The Project site is not located in an airport land use plan or within two miles of an airport. Therefore, there would be no impact.

- f) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No Impact. The Project would not include any physical barriers, nor would it interfere with any roadways in such a way that would impede emergency or hazards response. The Project would not interfere with implementation of an emergency response plan or evacuation plan. There would be no impact.

- g) Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Less than Significant Impact. Activities taking place at the Project site and the surrounding lands consist of operations related to agriculture uses and irrigation water delivery. The Project would not include any residential components, nor would it require any employees to be stationed permanently at the site on a daily basis. Any impact would be less than significant.

4.10 HYDROLOGY AND WATER QUALITY

Table 4-16: Hydrology and Water Quality Impacts

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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 off-site;	☐	☐	☒	☐
iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv. impede or redirect flood flows?	☐	☐	☒	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

4.10.1 Baseline Conditions

The Project lies within the Mud Slough-San Joaquin River watershed and the Sand Slough-San Joaquin River subwatershed. The nearest surface water to the Project is Mariposa Slough which runs through the Project site.

Mariposa Slough receives water from a section of the San Joaquin River near Mendota and also from the Fresno River, Dry Creek, Berenda Slough, and the Chowchilla River. Downstream of the Project site, Mariposa Slough connects back to the San Joaquin River near the San Luis National Wildlife Refuge, and the San Joaquin River continues northwest to the San Joaquin-Sacramento River Delta, near Stockton.

The Project is located in the Merced Groundwater Subbasin boundary, and the District is a member of the Merced Subbasin Groundwater Sustainability Agency (GSA) under the Sustainable Groundwater Management Act (SGMA). The Merced Subbasin GSA has a goal to achieve sustainable groundwater management on a long-term average basis by increasing recharge and/or reducing groundwater pumping, while avoiding undesirable results.¹⁷

4.10.2 Impact Analysis

a) Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Less than Significant Impact. As mentioned previously, the SWRCB requires that a SWPPP be prepared for projects that disturb one (1) or more acres of soil. A SWPPP involves site planning and scheduling, limiting disturbed soil areas, and determining BMPs to minimize the risk of pollution and sediments being discharged from construction sites. Implementation of the SWPPP would minimize the potential for the Project to substantially alter the existing drainage pattern in a manner that would result in substantial erosion or siltation onsite or offsite. Additionally, there would be no discharge to any surface source. However, by design, there would be percolation discharge to groundwater via the proposed recharge basins. Use of chemicals or surfactants would not be generated through the maintenance or operation of the Project and as such, there would be no discharge directly associated with Project implementation that could impact water quality standards. In addition, the Project would be required to comply with BMPs listed in the Merced County Stormwater Management Plan. By meeting its regulatory compliance requirements, the Project would not violate any water quality standards and would not impact waste discharge requirements. Therefore, impacts would be less than significant.

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

Less than Significant Impact. Mariposa Slough has high seepage losses and deliveries to turnout pumps in the last reach result in very high loss rates. To combat continued issues as a result of water loss, the Project would construct automated water control structures and flow measurement devices to existing culverts in the Mariposa Slough. In addition, the Project would construct recharge basins to increase groundwater recharge. This would, in turn, increase groundwater supplies.

The Project would also construct two new shallow groundwater wells. While this does have the potential to reduce the overall rate of recharge, two existing deep wells currently being pumped at the Project site may be abandoned, so there would not be any significant additional water pumped compared to existing conditions. In addition, the shallow groundwater wells would potentially help reduce subsidence that is an ongoing issue within the region and the overall San Joaquin Valley as a whole. Any impacts to groundwater supplies would be less than significant.

¹⁷ (Woodard & Curran 2022)

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

- i. result in substantial erosion or siltation on- or off-site;
- ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
- iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
- iv. impede or redirect flood flows?

c-i – c-iv) Less than Significant Impact. Construction activities would involve excavation, filling and grading of soils, which would expose areas to potential erosion during construction. Grading activities would be performed in accordance with Merced County standards. BMPs would be implemented during construction to further reduce potential impacts of erosion or siltation on or off site. Areas disturbed during construction would be restored. As mentioned previously, a SWPPP would be prepared to comply with the conditions of the NPDES general stormwater permit for construction activities.

Construction of facilities in and around the Mariposa Slough would take place during no-flow or low-flow conditions, when there are small amounts of water in the slough. Project work within the Mariposa Slough would include adding automated water control structures and flow measurement devices to existing culverts. Sediment and erosion control BMPs, appropriate to aquatic conditions would be employed when working in no-flow or low-flow conditions. Project work is anticipated to be started within the dry season. However, in the unlikely event that work may need to occur when normal flows are present within the work area, a flow bypass system/cofferdams would be installed. All work done in the slough would comply with the BMPs, which would reduce any potential impacts to the flow in the slough to less than significant.

d) Would the project in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundations?

Less than Significant Impact. The Project is not located in a tsunami or seiche zone and therefore would not release pollutants caused by tsunami or seiche inundations. The Project is located in a 1% annual chance flood hazard (see [Figure 4-3](#)). Since the Project is located in a flood hazard zone, the Project would be required to incorporate applicable BMPs to reduce any impacts of potential geological or water quality impacts. The Project would benefit from floods, as flood water could be stored within the proposed basins. The recharge basins also have the potential to reduce impacts to flooding by providing a destination for flood waters. Therefore, impacts would be less than significant.

e) Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

No Impact. The District is a member of the Merced Subbasin GSA. The Merced Subbasin GSA manages a portion of the underlying Merced Groundwater Subbasin. The Merced Subbasin GSA prepared a Groundwater Sustainability Plan (GSP) with the primary objective to achieve sustainable groundwater

management on a long-term average basis by increasing recharge and/or reducing groundwater pumping, while avoiding undesirable results. Groundwater overdraft has been an increasing concern for many years in the subbasin and throughout other basins in California. Overdraft occurs when groundwater use exceeds the amount of recharge into the aquifer, which leads to a decline in the groundwater level. While declining groundwater levels puts many farms at risk, it can also lead to subsidence. As mentioned in [Section 4.7 Geology and Soils](#), subsidence is an ongoing issue in the Merced Groundwater Subbasin and causes damage to various infrastructure. The Project, which includes groundwater recharge and transitioning pumping to the shallow aquifer above the Corcoran Clay, would reduce subsidence over the long term. Implementation of the Project aligns with the overall objective of the GSP; therefore, there would be no impact.

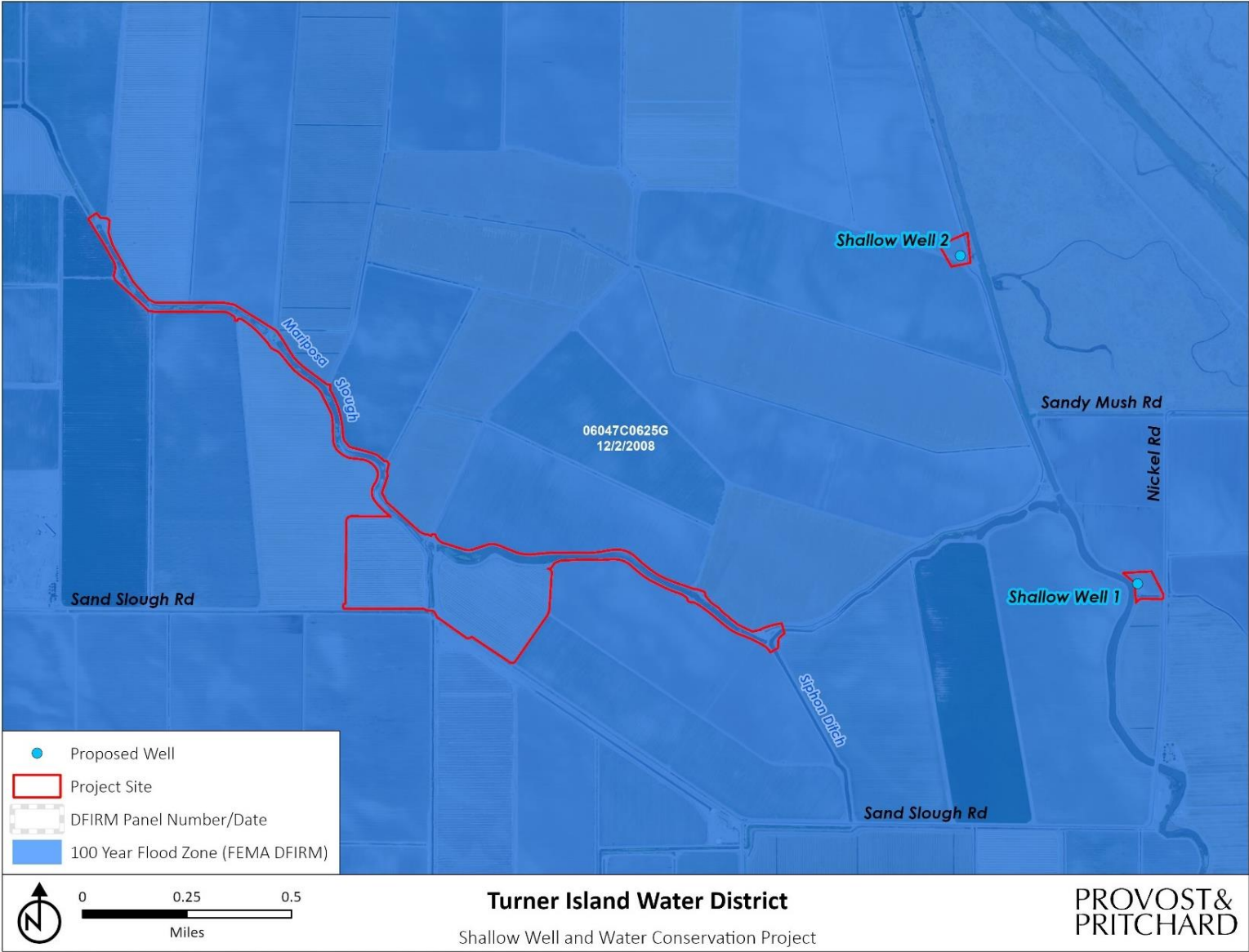


Figure 4-3. FEMA Flood Map

4.11 LAND USE AND PLANNING

Table 4-17: Land Use and Planning Impacts

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f) Physically divide an established community?	☐	☐	☐	☒
g) 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?	☐	☐	☐	☒

4.11.1 Baseline Conditions

The Project is located within an agricultural area of Merced County and the County is the land use authority. According to the Merced County Zoning Designation Map and the Merced County General Plan Designation Map, the Project area and its surrounding is zoned and planned for agricultural uses.¹⁸ The nearest city to the Project area is the City of Los Banos, located approximately 10.5 miles southwest.

4.11.2 Impact Analysis

a) Would the project physically divide an established community?

No Impact. The Project is located in a predominantly agricultural region within Merced County. The nearest city or community to the Project area is the City of Los Banos, which is located roughly 10.5 miles southwest. Due to the lack of an established community within or relatively near the Project area, the Project would not physically divide an established community. There would be no impact.

b) Would the project cause a significant environmental conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

No Impact. The Project area is zoned and planned for agricultural uses. Construction of the Project would not create new sources of water that would support any new housing or new permanent population growth that would exceed official regional or local population projections in the County. The goal of the Project is to recharge the underlying aquifer while being provided the ability to pump water above the Corcoran Clay. No impacts to land use are anticipated. The Project is consistent with the land use within the vicinity. Therefore, the Project would not conflict with any applicable plans, policies, or regulations. There would be no impact.

¹⁸ (Merced County 2023); (Merced County 2023)

4.12 MINERAL RESOURCES

Table 4-18: Mineral Resources Impacts

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
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?	☐	☐	☐	☒

4.12.1 Baseline Conditions

Mineral resources are defined as a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction.¹⁹ In Merced County, the primary mineral resource extracted is sand and gravel.²⁰ Due to the substantial alluvial deposition in Merced County, approximately 38 square miles of the County have been classified by the California Division of Mines and Geology for aggregate. Within those 38 square miles contain 10 Aggregate Resources Areas (ARA) which contain eight aggregate mines.²¹ The Project area is not delineated within a Merced County ARA.

4.12.2 Impact Analysis

a) Would the project 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?

No Impact. The Project area is not located in a designated ARA in Merced County; therefore, the Project would not result in the loss of availability of a known mineral resource. There would be no impact.

b) Would the project 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?

No Impact. Merced County has 10 ARAs that contain eight aggregate mines. The Project area is not located within or near any aggregate mine nor is the site itself an area that is known to contain mineral resources. Therefore, there would be no impact.

¹⁹ (New Boliden 2023)

²⁰ (Merced County 2013)

²¹ (Mintier & Associates 2012)

4.13 NOISE

Table 4-19: Noise Impacts

Would the project result in:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Generation of excessive ground borne vibration or ground borne 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?	☐	☐	☐	☒

4.13.1 Baseline Conditions

The primary noise sources in Merced County include traffic noise, noise from commercial businesses, and noise from recreation and outdoor play areas.²² The Project site is situated within a region dominated by agricultural uses, operations which may require diesel-powered equipment or other relatively loud machinery. Rural traffic is also a source of noise in the Project's vicinity with Sand Slough Road, Turner Island Road, Nickel Road, and Sandy Mush Road providing traffic circulation near the Project. Due to the Project's rural setting, there are no identified sensitive receptors within at least a two-mile radius.

Maximum noise levels generated by farm-related tractors typically range from 77 to 85 decibels at a distance of 50 feet from the tractor, depending on the horsepower of the tractor and the operating conditions. Due to the seasonal nature of the agricultural industry, there are often extended periods of time when little to no noise is generated at the Project site, followed by short-term periods of intensive mechanical equipment usage and corresponding noise generation.

²² (Merced County 2013)

Table 4-20: Typical Construction Noise Levels

Equipment	Typical Noise Level (dBA Lmax) 50 feet from Source
Backhoe/Front-End Loader	80
Compactor	80
Concrete Mixer Truck	85
Dozer	85
Drill Rig	84
Grader	85
Excavator/ Scraper	85
Air Compressor	80
Gradall (Forklift)	85
Generator	82
Truck (Dump/Flat Bed)	84
Paver	85
Pneumatic Tool	85
Pump	77
Roller	85
Concrete Saw	90
Source: (U.S. Department of Transportation Federal Highway Administration 2017)	

4.13.2 Impact Analysis

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

No Impact. Construction activity would generate temporary noise in the Project vicinity. Equipment used during construction may include excavators, backhoes, graders, skid steers, loaders, drills, and hauling trucks. The Federal Transportation Administration has a daytime construction noise threshold of 80 dBA L_{eq} . As mentioned above, the Project area does not contain any sensitive receptors within at least a two-mile radius. Therefore, due to distance attenuation, construction noise would not exceed levels above the designated threshold.

Operation of the Project would be passive. Any potential noise generated from water being pumped at the proposed well sites would be negligible and would not exceed the established noise thresholds. There would be no impact.

- b) Would the project result in generation of excessive ground borne vibration or ground borne noise levels?

No Impact. The effects of ground-borne vibration include detectable 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. As the Project does not have any sensitive receptors in at least a two-mile radius, there would be no impact resulting from excessive ground borne vibration or ground borne 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?

No Impact. The nearest public airport to the Project is the Merced Regional Airport, located approximately 11 miles northeast across a vast expanse of agricultural lands. The Project is also not located within an adopted airport land use plan. Therefore, there would be no impact.

4.14 POPULATION AND HOUSING

Table 4-21: Population and Housing Impacts

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

4.14.1 Baseline Conditions

Merced County has an estimated population currently at 290,014, as of July 2022.²³ The United States Census Bureau estimates that Merced County contains approximately 90,329 housing units, also as of July 2022. The Project area is located in an unincorporated area of the County, which is located outside of areas that are densely populated. The Project is located in a rural agricultural region of the County located approximately 10.5 miles northeast of Los Banos, which is the nearest city to the Project.

4.14.2 Impact Analysis

a) Would the project 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)?

No Impact. The Project would include the construction of two recharge basins, two shallow groundwater wells, and supporting infrastructure to existing culverts at road crossings at the Mariposa Slough. The purpose of the Project is to recharge the underlying aquifer above the Corcoran Clay, while also providing the capability to pump the recharged water and other existing waters that are located in the upper aquifer. The Project would not induce substantial unplanned population growth in an area directly or indirectly. There would be no impact.

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

No Impact. As mentioned above, the Project would include the construction of two recharge basins, two shallow groundwater wells, and supporting infrastructure to existing culverts at road crossings at the Mariposa Slough. The Project is not located in an urbanized area that contains a large number of people or housing. The Project area is located in a rural agricultural area that has not been planned for a large

²³ (United States Census Bureau 2023)

population. Therefore, the Project would not displace existing people or housing. There would be no impact.

4.15 PUBLIC SERVICES

Table 4-22: Public Services

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

4.15.1 Baseline Conditions

Fire Protection: The Project area would be served by the Merced County Fire Department. The closest fire station is Merced County Fire Station 61, located approximately 10.2 miles northeast of the Project.

Police Protection: Police protection is provided by the Merced County Sheriff. The closest station is located in the community of Delhi, located approximately 16.4 miles northwest of the Project.

Schools: Los Banos Elementary School, the closest school to the Project site, is located approximately 11.1 miles southwest of the Project site.

Parks: The closest park to the Project site is Skylar Park, located approximately 9.6 miles to southwest.

Landfills: The nearest landfill to the Project site is the Billy Wright Landfill, located approximately 17.7 miles southwest.

4.15.2 Impact Analysis

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

i. Fire Protection:

ii. Police Protection:

- iii. Schools:
- iv. Parks:
- v. Other public facilities:

a-i – a-v) No Impact. The Project would not require new or altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for public services. The Project would include the construction of two recharge basins, two shallow groundwater wells, and supporting infrastructure to existing culverts at road crossings at the Mariposa Slough. Implementation of the Project would have no impact on the listed public services.

4.16 RECREATION

Table 4-23: Recreation Impacts

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) 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?	☐	☐	☐	☒

4.16.1 Baseline Conditions

Merced County contains approximately 114,000 acres of County, State, and Federal park and recreation facilities.²⁴ Recreation facilities within Merced County supports a variety of activities that include swimming, boating, hiking, picnicking, and sporting activities. The nearest recreational facility to the Project is the Merced National Wildlife, located approximately 2.2 miles east. In addition, the San Luis National Wildlife Refuge and the Refuge Los Banos Wildlife Area Birding Trail are both within a five-mile radius of the Project area. These facilities are open to the public and contain nature trails to view the local habitat.

4.16.2 Impact Analysis

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?

No Impact. The Project would include the construction of two recharge basins, two shallow groundwater wells, and supporting infrastructure to existing culverts at road crossings at the Mariposa Slough in an existing rural agricultural region of the County. Implementation of the Project would not result in an increase of people in the area; therefore, the Project would not increase the use of existing neighborhood parks, regional parks, or other recreational facilities. There would be no impact.

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

No Impact. The Project would not include recreational facilities or require the construction or expansion of recreational facilities. The Project would include the construction of two recharge basins, two shallow groundwater wells, and supporting infrastructure to existing culverts at road crossings at the Mariposa Slough. There would be no impact.

²⁴ (Merced County 2013)

4.17 TRANSPORTATION

Table 4-24: Transportation Impacts

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Conflict or be inconsistent with CEQA Guidelines 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?	☐	☐	☐	☒

4.17.1 Baseline Conditions

The Project is located in an agricultural region of Merced County. The Project area is located within the northwestern quadrant created by Sand Slough Road and Nickel Road. The nearest highway to the Project is Highway 165, which is located approximately 4.5 miles west. The roads in the immediate vicinity of the Project consist of typical County roads. These roads consist of one lane in each direction with no curb or gutter.

4.17.2 Impact Analysis

a) Would the project conflict with a 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)?

a and b) Less than Significant Impact. Construction traffic associated with the Project would be temporary. Operational traffic would consist of as-needed maintenance trips to the recharge facilities and wells as part of normal operation and maintenance activities. There would not be a permanent adverse effect to existing roadways in the area.

There are no pedestrian or bicycle facilities in the vicinity of the site. Therefore, the Project would not conflict with any congestion management plan or any other applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system. Impacts would be less than significant.

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

No Impact. No new roadway design features are associated with the Project. Therefore, there would be no impact.

d) Would the project result in inadequate emergency access?

No Impact. The Project would not include new roadway design features or permanent alterations to roadways. The Project may include temporary construction access roadways and staging areas for construction equipment, but there would not be any obstruction to existing permanent roadways, that could result in the obstruction of emergency access. No construction or maintenance vehicles would obstruct the existing roadways. Therefore, there would be no impacts to emergency access on local roadways.

4.18 TRIBAL CULTURAL RESOURCES

Table 4-25: Tribal Cultural Resources Impacts

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i. Listed or eligible for listing in the California Register of Historical Resources, or in the 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.	☐	☒	☐	☐

4.18.1 Baseline Conditions

The Project site is in the Northern Valley Yokuts ethnographic territory of the San Joaquin Valley. The Yokuts were generally divided into three major groups, the Northern Valley Yokuts, the Southern Valley Yokuts, and the Foothill Yokuts. Much of the research from ethnographers focuses on the central Yokuts tribes due to the northernmost tribes being impacted by Euro-Americans during the California Gold Rush of the mid 1800s and by the southernmost tribes often being removed and relocated by the Spanish to various Bay Area or coastal missions. The central Yokuts tribes, and especially the western Sierra Nevada foothill tribes, were the most intact at the time of ethnographic study.

The Project area is centered on Mariposa Slough, which prior to reclamation would have been accentuated by numerous sinuous side channels, creating consistent marsh and swamp-like conditions punctuated by flooding, likely seasonally. These conditions are common in areas at the confluence of drainages with major rivers (e.g., San Joaquin River, Merced River, etc.) in the Central Valley and, combined with periodic flooding, necessitated strategic use of these areas which generally emphasized higher ground, typically consisting of low rises on the otherwise flat valley floor or the foothills surrounding the valley. The only

previously recorded prehistoric sites in the vicinity of the Project area are all located on knolls or small rises. These sites are described as habitation sites, but it is not known if they were temporary or seasonal campsites or larger village sites. There is a dearth of knowledge on Northern Valley Yokut tribal territories and village locations, but what is known indicates that villages located on the east side of the San Joaquin River were primarily located along major tributaries of the San Joaquin River and nearer the foothills of the Sierra Nevada or located on the more arid west side of the San Joaquin River. These locations are far removed from the vicinity of the Project ([Appendix C](#)).

Native American Outreach

The Native American Heritage Commission (NAHC) in Sacramento was also contacted in June 2023. They were provided with a brief description of the Project and a map showing its location and requested that the NAHC perform a search of the Sacred Lands File to determine if any Native American resources have been recorded in the immediate APE. ASM sent out letters and emails to tribal organizations on the NAHC contact list to determine whether any organization wished to consult under AB 52. One response was received from Elizabeth Kipp, Chairperson, for the Big Sandy Rancheria of Western Mono Indians, stating that they have no comments or concerns about the Project. No additional responses were received from the provided list of tribes.

4.18.2 Impact Assessment

- 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 the 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.

Less than Significant Impact with Mitigation Incorporated. No request for tribal consultation was made for the Project. Although unlikely, in the event cultural materials or human remains are unearthed during excavation or construction, mitigation Measures **CUL-2** and **CUL-3** will be implemented in order to maintain less than significant impacts (see [Section 4.5.3](#)). With the inclusion of said mitigation measures, impacts would be less than significant.

4.18.3 Mitigation

See **CUL-2** and **CUL-3** above in [Section 4.5.3](#).

4.19 UTILITIES AND SERVICE SYSTEMS

Table 4-26: Utilities and Service Systems Impacts

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒
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?	☐	☐	☐	☒

4.19.1 Baseline Conditions

Irrigation water is currently provided in the Project area by the District. The District operates and maintains approximately seven return pumps, 25 lift pumps, 24 wells, and 20 miles of canals and pipelines.²⁵ Gas and electricity are provided PG&E and solid waste is handled by the Merced County Regional Waste Authority. Solid waste is transported to either one of two landfills in the County: the Billy Wright or the Highway 59 Disposal Site.

4.19.2 Impact Analysis

a) Would the project 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?

No Impact. The Project would not require relocation or expansion of existing facilities for wastewater treatment, storm water drainage, electric power, natural gas, or telecommunications. The Project would

²⁵ (LAFCo of Merced County 2017)

include the construction of two recharge basins, two shallow groundwater wells, and supporting infrastructure to existing culverts at road crossings at the Mariposa Slough. The Project would increase water supply, improve groundwater conditions, potentially reduce costs to produce groundwater, increase diversification and availability of water supplies, reduce impacts of subsidence, and facilitate compliance with the Sustainable Groundwater Management Act. There would be no impact.

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

No Impact. The purpose of the Project is to ensure water availability for agricultural water users during normal, dry, and multiple dry years. The Project would increase recharge capabilities by providing new facilities and reducing water loss. The Project also involves construction of two new groundwater wells. These wells would be drilled to a depth of approximately 200 feet which would be above the Corcoran Clay, reducing impacts brought on by subsidence. Implementation of the Project would not result in the Project having insufficient water. There would be no impact.

- c) Would the project 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?

No Impact. The Project would not require wastewater treatment; therefore, the Project would not impact a wastewater treatment provider. There would be no impact.

- d) Would the project 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?

No Impact. The Project would include the construction of two recharge basins, two shallow groundwater wells, and supporting infrastructure to existing culverts at road crossings at the Mariposa Slough. Operation would not result in an increase in solid waste generation. Any waste generated during construction would be the responsibility of the contractor and disposed of in compliance with current regulations. In addition, solid waste generated by the Project would be minimal due to its temporary nature. Construction would result in solid waste disposal needs but not in excess of landfill capacity. Therefore, there would be no impact.

- e) Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

No Impact. The Project would create a temporary increase in the amount of solid waste generated during construction. The Project would comply with all federal, State, and local rules, regulations, and statutes related to the reduction of solid waste. Therefore, there would be no impact.

4.20 WILDFIRE

Table 4-27: Wildfire Impacts

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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 uncontrollable spread of 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?	☐	☐	☐	☒

4.20.1 Baseline Conditions

The Project is located in Merced County within the San Joaquin Valley. The physical setting of the Project area consists of flat agricultural land containing row crops, orchards, irrigation delivery systems, rural County roads, and other typical rural/agricultural infrastructure. The Project area contains a natural waterway known as the Mariposa Slough, which ultimately connects to the San Joaquin River in the north quadrant of the Project area. According to the California Department of Forestry and Fire Protection (CalFire), the Project area is not located within a Very High Fire Hazard Severity Zone.²⁶ Furthermore, the Project is neither located within a high or moderate fire hazard severity zone. According to CalFire, the Project is not located within a State Responsibility Area (SRA), meaning CalFire does not assume responsibility for wildfire prevention and protection, and it is managed at the local level.²⁷

4.20.2 Impact Analysis

a) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

²⁶ (California Department of Forestry and Fire Protection 2022)

²⁷ (California Department of Forestry and Fire Protection 2022)

- b) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project 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) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project 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) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project 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?

a-d) No Impact. The Project area is located in a section of Merced County that has not been designated as either a Very High Fire Hazard Severity Zone or an SRA. Therefore, further analysis is not required and there would be no impact.

4.21 CEQA MANDATORY FINDINGS OF SIGNIFICANCE

Table 4-28: CEQA Mandatory Findings of Significance

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

4.21.1 Statement of Findings

- 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?

Less than Significant Impacts with Mitigation Incorporated. The analysis conducted in this IS/MND results in a determination that the Project, with incorporation of mitigation measures, would have a less than significant effect on the environment. The potential for impacts to biological resources, cultural resources, geological resources and tribal cultural resources from the construction and operation of the Project would be less than significant with the incorporation of the mitigation measures discussed in **Chapter 5 Mitigation, Monitoring, and Reporting Program**. Accordingly, the Project would involve no potential for significant impacts through the degradation of the quality of the environment, the reduction in the habitat or population of fish or wildlife, including endangered plants or animals, the elimination of a plant or animal community or example of a major period 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)?

Less than Significant Impact. CEQA Guidelines Section 15064(i) States that a Lead Agency shall consider whether the cumulative impact of a project is significant and whether the effects of the project are cumulatively considerable. The assessment of the significance of the cumulative effects of a project must, therefore, be conducted in connection with the effects of past projects, other current projects, and probable future projects. The Project would include the construction of two recharge basins, two shallow groundwater wells, and supporting infrastructure to existing culverts at road crossings at the Mariposa Slough. No additional roads would be constructed as a result of the Project, nor would any additional public services be required. The Project is not expected to result in direct or indirect population growth. Therefore, implementation of the Project would not result in significant cumulative impacts and all potential impacts would be reduced to less than significant through the implementation of mitigation measures and basic regulatory requirements incorporated into future Project design.

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

Less than Significant Impact. The Project would include the construction of two recharge basins, two shallow groundwater wells, and supporting infrastructure to existing culverts at road crossings at the Mariposa Slough. The Project in and of itself would not create a significant hazard to the public or the environment. Construction-related air quality/dust exposure impacts could occur temporarily as a result of project construction. However, implementation of basic regulatory requirements identified in this IS/MND would ensure that impacts are less than significant. Therefore, the Project would not have any direct or indirect adverse impacts on humans. This impact would be less than significant.

CHAPTER 5 MITIGATION, MONITORING, AND REPORTING PROGRAM

This Mitigation Monitoring and Reporting Program (MMRP) has been formulated based upon the findings of the Initial Study/Mitigated Negative Declaration (IS/MND) for the Turner Island Water District Shallow Well Drilling and Water Conservation Project in the County of Merced. The MMRP lists mitigation measures recommended in the IS/MND for the Project and identifies monitoring and reporting requirements.

Table 5-1: Mitigation, Monitoring, and Reporting Program presents the mitigation measures identified for the Project. Each mitigation measure is numbered with a symbol indicating the topical section to which it pertains, a hyphen, and the impact number. For example, AIR-2 would be the second mitigation measure identified in the Air Quality analysis of the IS/MND.

The first column of **Table 5-1: Mitigation, Monitoring, and Reporting** Program identifies the mitigation measure. The second column, entitled “When Monitoring is to Occur,” identifies the time the mitigation measure should be initiated. The third column, “Frequency of Monitoring,” identifies the frequency of the monitoring of the mitigation measure. The fourth column, “Agency Responsible for Monitoring,” names the party ultimately responsible for ensuring that the mitigation measure is implemented. The last columns will be used by the Lead and Responsible Agencies to ensure that individual mitigation measures have been complied with and monitored.

Table 5-1: Mitigation, Monitoring, and Reporting Program

Mitigation, Monitoring, and Reporting Program						
Item	Mitigation Measure	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
Biological Resources						
Migratory Birds, Raptors, and Special Status Birds						
BIO-1	(Avoidance): The Project's construction activities will occur, if feasible, between September 16 and January 31 (outside of the nesting bird season) to avoid impacts to nesting birds.	September 16 to January 31	Prior to construction activities	TIWD with assistance of a qualified biologist		
BIO-2	(Pre-construction Surveys): If activities must occur within nesting bird season (February 1 to September 15), a qualified biologist will conduct a pre-construction survey for Swainson's hawk nests onsite and up to a 0.5-mile radius within five calendar days prior to the start of construction. The Swainson's hawk survey will not be completed between April 21 to June 10 due to the difficulty of identifying nests during this time of year. The survey would also include inspecting for nesting migratory birds within up to 100 feet outside of the Project area and for other nesting raptors within up to 500 feet outside of the Project area. All raptor nests would be considered "active" upon the nest-building stage. If no active nests are observed, no further mitigation is required.	Prior to construction activities between February 1 to September 14	Once, prior to construction	TIWD with assistance of a qualified biologist		
BIO-3	(Avoidance Buffers): On discovery of any active nests or breeding colonies near work areas, a qualified biologist will determine appropriate avoidance buffer distances based on applicable CDFW and/or USFWS guidelines, the biology of the species, conditions of the nest(s), and the level of Project disturbance.	During construction	As determined by qualified biologist during construction activities	TIWD with assistance of a qualified biologist		
Western Pond Turtle and Western Spadefoot						
BIO-4	(Pre-construction Survey): A qualified biologist would complete a preconstruction survey for western pond turtle and western spadefoot within 3 calendar days of the start of construction activities.	Within 3 days prior to the start of construction	Once, prior to construction	TIWD with assistance of a qualified biologist		

Mitigation, Monitoring, and Reporting Program						
Item	Mitigation Measure	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
BIO-5	(Avoidance): If any western pond turtles or western spadefoot are observed in the Project area, they should be allowed to leave the site of their volition.	During construction	During construction	TIWD with assistance of a qualified biologist		
BIO-6	(Relocation): If avoidance is not feasible, a qualified biologist would relocate the animal out of harm's way. The biologist should take into consideration the biology of the species in question when choosing where to relocate the animal to.	During construction	During construction	TIWD with assistance of a qualified biologist		
Rare Plant Species						
BIO-7	(Rare Plant Surveys): A qualified botanist/biologist will conduct focused rare plant surveys during the appropriate blooming seasons for alkali milk-vetch, alkali-sink goldfields, delta button-celery, heartscale, Heckard's pepper-grass, hispid salty bird's-beak, Hoover's spurge, prostrate vernal pool navarretia, San Joaquin spearscale, Sanford's arrowhead, and Wright's trichocoronis, according to CDFW's Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (2018) for areas where ground disturbance will occur and prior to the start of construction.	During appropriate blooming seasons prior to the start of construction	Once, as determined by qualified biologist during construction activities	TIWD with assistance of a qualified biologist		
BIO-8	(Avoidance): If rare plants are identified, an avoidance buffer and, if necessary, use of exclusion fencing, will be placed around the area so as not to disturb the plants or their root system.	During construction	During construction	TIWD with assistance of a qualified biologist		
BIO-9	(Relocation Plan): If rare plant individuals or populations are identified within Project work areas, and the plants cannot be avoided, a relocation plan will be prepared and approved by the appropriate agencies.	During construction	During construction	TIWD with assistance of a qualified biologist		
Riparian Habitat						
BIO-10	(Avoidance): Permanent impacts to riparian habitat will be avoided.	During construction	During construction	TIWD with assistance of a qualified biologist		

Mitigation, Monitoring, and Reporting Program						
Item	Mitigation Measure	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
BIO-11	(Agreement): Should permanent impacts to riparian habitat be required a CDFW Streamed Alteration Agreement will be obtained, as described in BIO-14.	During construction	During construction	TIWD with assistance of a qualified biologist		
Regulated Waters						
BIO-12	(Delineation): Once Project activities are determined, an aquatic resources delineation will be prepared for the Project area, to determine the boundaries of all potentially jurisdictional waters present.	Prior to construction	Once, as determined by qualified biologist during construction activities	TIWD with assistance of a qualified biologist		
BIO-13	(Minimization): Based on the results of the aquatic resources delineation, the Project will be designed to minimize impacts to potentially jurisdictional waters to the maximum extent practicable while still achieving the goal of the Project.	Prior to construction	Once, as determined by qualified biologist during construction activities	TIWD with assistance of a qualified biologist		
BIO-14	(Permits): If the final Project design requires impacts to areas of jurisdictional waters, permits under Section 404 and 401 of the Clean Water Act and a CDFW Streambed Alteration Agreement will be obtained for the Project, and the Project will adhere to all conditions of the permits, such as compensatory mitigation requirements, survey requirements, monitoring requirements, timing requirements and reporting requirements.	Prior to construction	Once, as determined by qualified biologist during construction activities	TIWD with assistance of a qualified biologist		
Cultural Resources						
CUL-1	All construction personnel take a Cultural Resources Awareness Training given by a qualified archaeologist in order to become familiar with the types of cultural artifacts that exist within the vicinity of the APE and could potentially be uncovered.	During construction	Daily during construction activities	TIWD		
CUL-2	In the unlikely event that cultural resources are identified during construction, it is recommended that all work be stopped within 100-ft of the discovery and a qualified archaeologist be called out to evaluate the find.	During construction	Daily during construction activities	TIWD		

Mitigation, Monitoring, and Reporting Program						
Item	Mitigation Measure	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
CUL-3	In the event that any human remains are discovered on the Project site, the Merced County Coroner must be notified of the discovery (California Health and Safety Code, Section 7050.5) and all activities in the immediate area of the find or in any nearby area reasonably suspected to overlie adjacent human remains must cease until appropriate and lawful measures have been implemented. If the Coroner determines that the remains are not recent, but rather of Native American origin, the Coroner shall notify the Native American Heritage Commission (NAHC) in Sacramento within 24 hours to permit the NAHC to determine the Most Likely Descendent of the deceased Native American.	During construction	Daily during construction activities	TIWD		
Geology and Soils						
GEO-1	Should paleontological resources be encountered on the Project site, all ground disturbing activities in the area shall stop. A qualified paleontologist shall be contacted to assess the discovery. Mitigation may include monitoring, recording the fossil locality, data recovery and analysis, and a final report. Public educational outreach may also be appropriate. Upon completion of the assessment, a report documenting methods, findings, and recommendations shall be prepared and submitted to Merced County for review, and (if paleontological materials are recovered) a paleontological repository, such as the University of California Museum of Paleontology.	During construction	Daily during construction activities	TIWD		
Tribal Cultural Resources						
See CUL-2 and CUL-3 .						

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Appendix A: CalEEMod Output Files

Turner Island Shallow Well Drilling and Water Conservation Project Custom Report

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8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Turner Island Shallow Well Drilling and Water Conservation Project
Construction Start Date	1/1/2025
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.80
Precipitation (days)	25.0
Location	Sand Slough Rd, Dos Palos, CA 93620, USA
County	Merced
City	Unincorporated
Air District	San Joaquin Valley APCD
Air Basin	San Joaquin Valley
TAZ	2310
EDFZ	5
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.26

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Other Non-Asphalt Surfaces	99.0	Acre	99.0	0.00	0.00	—	—	—

2. Emissions Summary

2.2. Construction Emissions by Year, Unmitigated

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

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	3.92	3.31	29.8	29.6	0.06	1.23	3.74	4.98	1.14	1.46	2.60	—	6,769	6,769	0.28	0.06	0.68	6,795
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	3.91	3.30	29.8	29.3	0.06	1.23	3.74	4.98	1.14	1.46	2.60	—	6,751	6,751	0.28	0.06	0.02	6,776
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.85	1.56	14.1	13.9	0.03	0.59	1.77	2.36	0.54	0.69	1.23	—	3,202	3,202	0.13	0.03	0.14	3,214
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.34	0.29	2.57	2.54	0.01	0.11	0.32	0.43	0.10	0.13	0.22	—	530	530	0.02	< 0.005	0.02	532

3. Construction Emissions Details

3.1. Grading (2025) - Unmitigated

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

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

Off-Road Equipm ent	3.80	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipm ent	3.80	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipm ent	1.80	1.52	14.1	13.4	0.03	0.59	—	0.59	0.54	—	0.54	—	3,128	3,128	0.13	0.03	—	3,138
Dust From Material Movement	—	—	—	—	—	—	1.70	1.70	—	0.68	0.68	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Turner Island Shallow Well Drilling and Water Conservation Project Custom Report, 7/19/2024

Off-Road Equipm	0.33	0.28	2.57	2.45	0.01	0.11	—	0.11	0.10	—	0.10	—	518	518	0.02	< 0.005	—	520
Dust From Material Movement	—	—	—	—	—	—	0.31	0.31	—	0.12	0.12	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.11	0.07	1.27	0.00	0.00	0.15	0.15	0.00	0.04	0.04	—	171	171	0.01	0.01	0.68	173
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.10	0.96	0.00	0.00	0.15	0.15	0.00	0.04	0.04	—	152	152	0.01	0.01	0.02	154
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.04	0.48	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	74.4	74.4	< 0.005	< 0.005	0.14	75.5
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.09	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.3	12.3	< 0.005	< 0.005	0.02	12.5
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Grading	Grading	1/1/2025	8/30/2025	5.00	173	—

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
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Back hoes	Diesel	Average	2.00	8.00	84.0	0.37

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Grading	—	—	—	—
Grading	Worker	20.0	10.9	LDA,LDT1,LDT2
Grading	Vendor	—	8.27	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Grading	—	—	387	0.00	—

5.6.2. Construction Earthmoving Control Strategies

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

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Per lead agency

Appendix B: Biological Resources Evaluation

Biological Evaluation

TURNER ISLAND WATER DISTRICT

WATER CONSERVATION PROJECT

JUNE 2023

Roman Endicott, Biologist

PROVOST & PRITCHARD CONSULTING GROUP | 455 W. FIR AVE, CLOVIS CA 93611



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Appendix D: NRCS Web Soil Survey Report

I. Introduction

The following technical report, prepared by Provost & Pritchard Consulting Group (Provost & Pritchard) in compliance with the California Environmental Quality Act (CEQA), includes a description of the biological resources present or with potential to occur within the proposed Shallow Well Drilling Project and Water Conservation Project (or “project”) and evaluates potential project-related impacts to those resources.

Project Description

The project site (or “site”) is located approximately 12-15 miles southwest of the City of Merced in the central portion of Merced County, California, within the San Joaquin Valley (see **Figure 1** and **Figure 2**). The project area is approximately 99 acres and includes farm access roads, agricultural fields, and canals, including the Mariposa Slough (see **Figure 3**). The surrounding area consists of the Mariposa Bypass to the North, Merced National Wildlife Refuge to the east, agricultural land to the south, and San Luis National Wildlife Refuge to the west.

The Turner Island Water District (TIWD) has proposed the Shallow Well Drilling Project (SWDP) that would reduce land subsidence problems and the Water Conservation Project (WCP) that would reduce loss of water from existing structures. In this analysis, the SWDP and WCP have been combined into one project. The project would involve the construction and operation of two new wells screened above hydric soils so that their use could reduce TIWD’s reliance on the lower aquifer. The new wells would be drilled to a maximum depth of approximately 200 feet. A new groundwater recharge basin would be constructed to replace two agricultural fields south of Mariposa Slough. The project would also involve some combination of adding automated water control structures to pipe culverts, flow measurement devices, improvements to avoid or reduce losses in the last reach of Mariposa Slough, and possibly a spill capture reservoir with an additional pump and pipeline return system.

Report Objectives

Construction activities such as those proposed by the project could potentially damage biological resources or habitats that are crucial for sensitive plant and wildlife species. In cases such as these, development may be regulated by state or federal agencies, and/or addressed by local regulatory agencies.

This report addresses issues related to the following:

1. The presence of sensitive biological resources on the project site, or with the potential to occur on the project site.
2. The federal, state, and local regulations regarding these resources.
3. Mitigation measures that may be required to reduce the magnitude of anticipated impacts and/or comply with permit requirements of state and federal resource agencies.

Therefore, the objectives of this report are:

1. Summarize all project area-specific information related to existing biological resources.
2. Make reasonable inferences about the biological resources that could occur within the project site based on habitat suitability and the proximity of the project site to a species’ known range.
3. Summarize all state and federal natural resource protection laws that may be relevant to implementation of the project.
4. Identify and discuss project impacts and effects to biological resources likely to occur onsite within the context of CEQA and/or state or federal laws.

5. Identify and prescribe a set of avoidance and mitigation measures that would reduce impacts to a less-than-significant level (as identified by CEQA) and are generally consistent with recommendations of the resource agencies for affected biological resources.

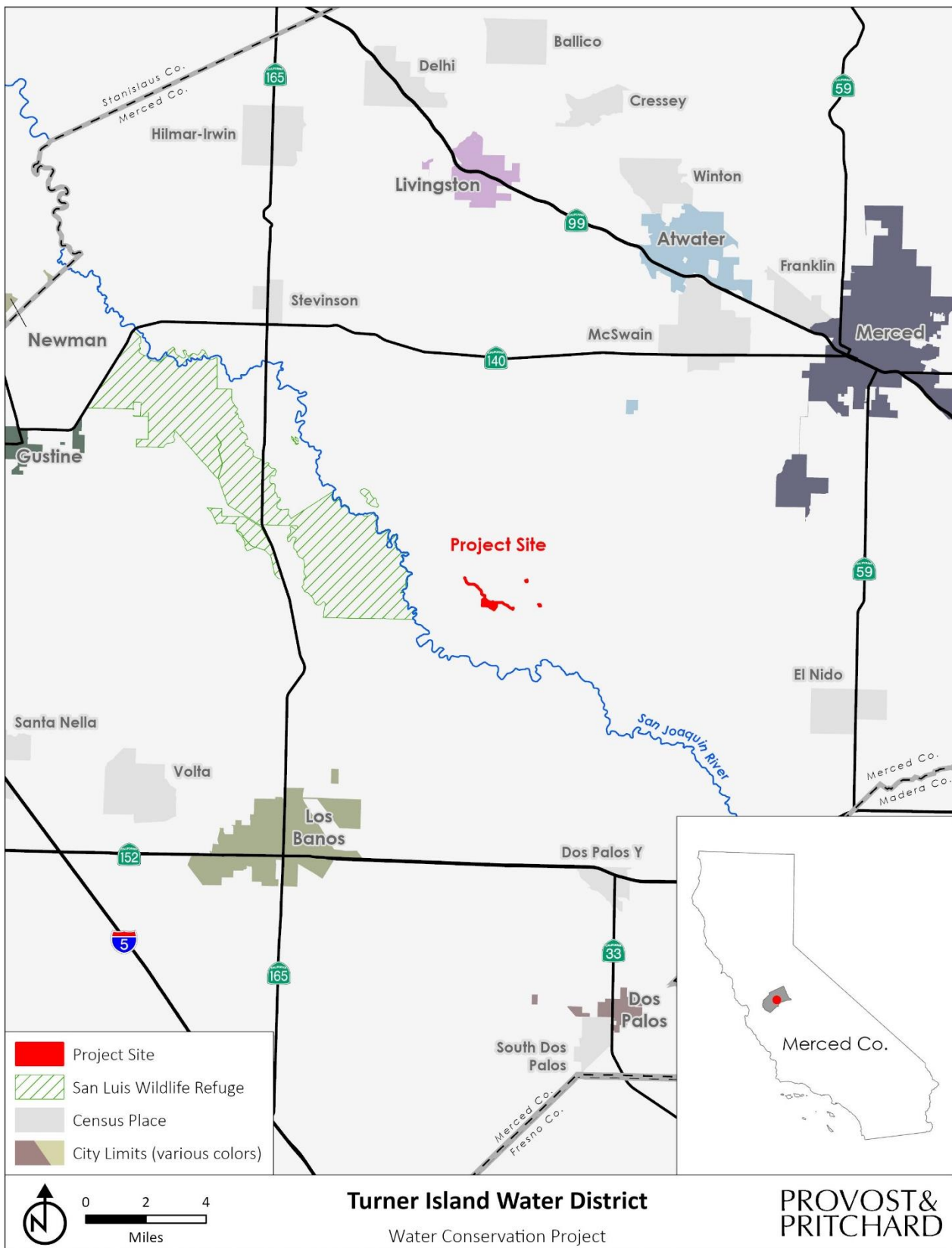


Figure 1. Regional Location Map

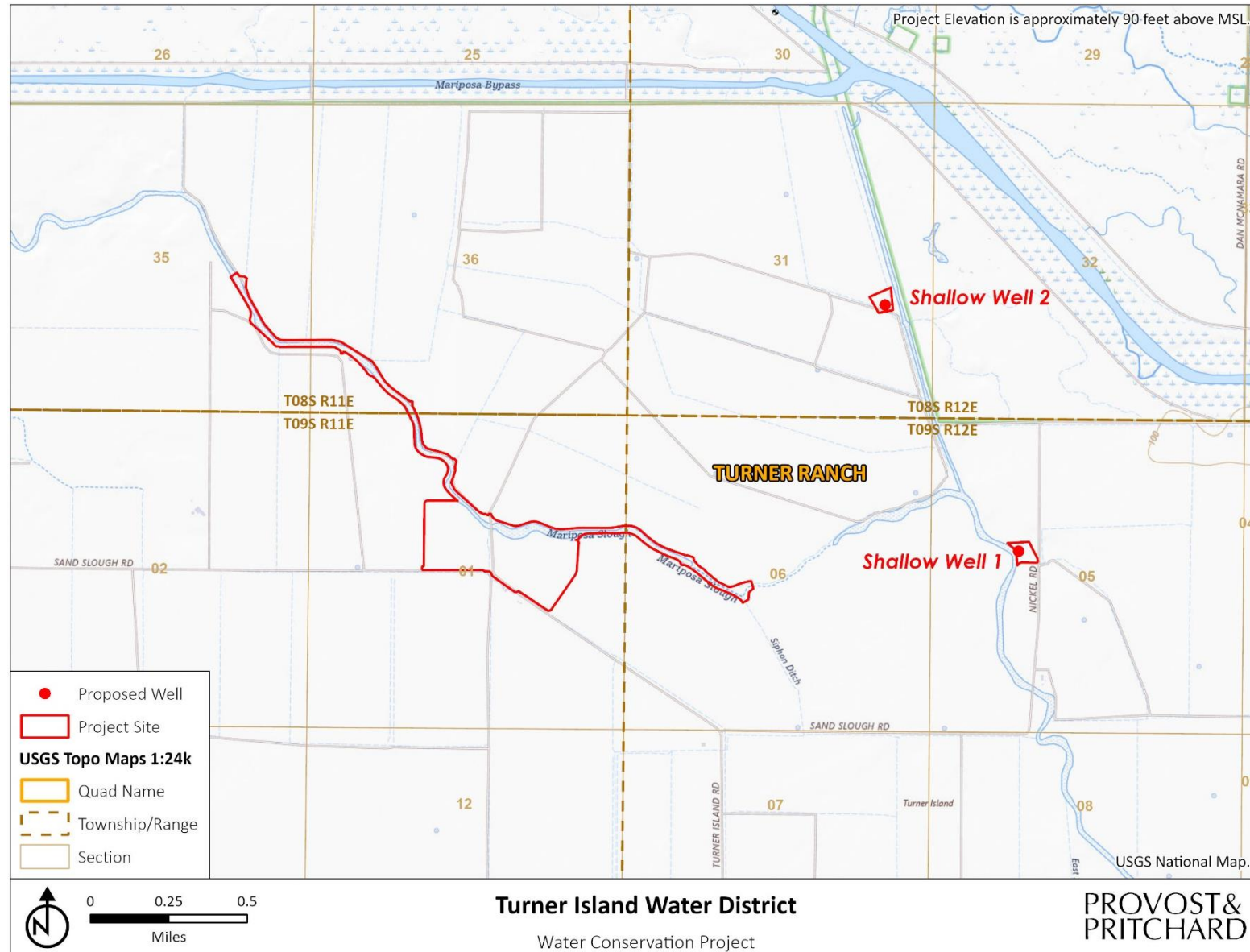


Figure 2. Topographic Quadrangle Map

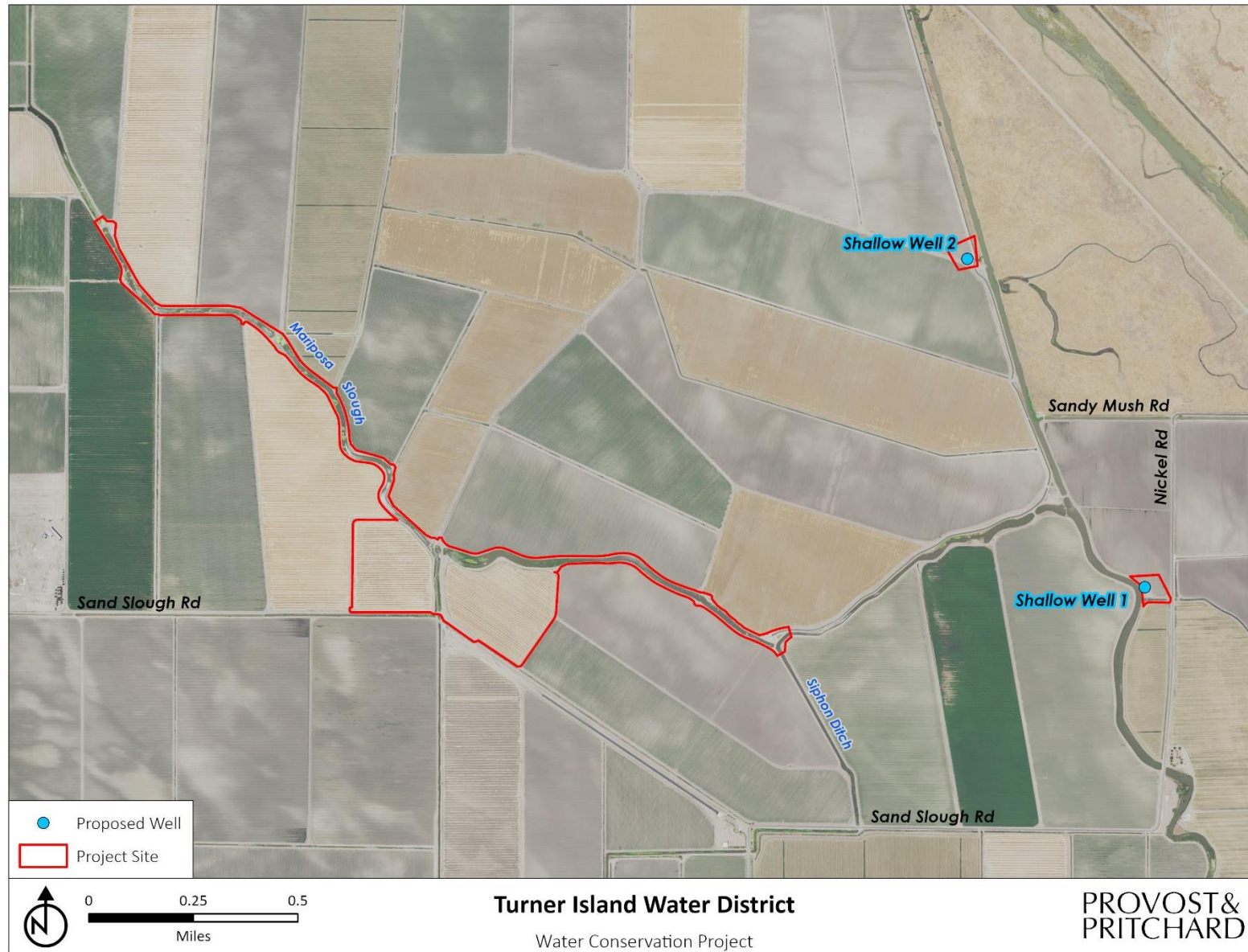


Figure 3. Project Area Map

Study Methodology

A reconnaissance-level field survey of the project site was conducted on May 23, 2023, by Provost & Pritchard biologist, Roman Endicott. The survey consisted of walking and driving throughout the project area while identifying and noting land uses, biological habitats and communities, and plant and animal species encountered, and assessing habitats that could be suitable for various rare or protected plant and animal species. Representative photographs of the site were taken and are presented in [Appendix A](#).

Mr. Endicott conducted an analysis of potential project-related impacts to biological resources based on the resources known to exist or with the potential to exist within the project site. Sources of information used in preparation of this analysis included: the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB; see [Appendix B](#) for the Species List) and California Wildlife Habitat Relationships (CWHR) database; California Native Plant Society's (CNPS) Online Inventory of Rare and Endangered Vascular Plants of California; CalFlora's online database of California native plants; Jepson Herbarium's online database (i.e., Jepson eFlora); United States Fish and Wildlife Service's (USFWS) Environmental Conservation Online System (ECOS) Information for Planning and Consultation (IPaC; see [Appendix C](#) for the Species List), and National Wetlands Inventory (NWI); iNaturalist; NatureServe Explorer's online database; United States Department of Agriculture (USDA) Natural Resources Conservation Service's (NRCS) Web Soil Survey (see [Appendix D](#) for the Web Soil Survey Report); California Herps website; and various manuals, reports, and references related to plants and animals of the San Joaquin Valley region.

The field survey did not include focused surveys for special status species. The field survey conducted included the appropriate level of detail to assess the significance of potential impacts to sensitive biological resources resulting from implementing the project. Furthermore, the field survey was sufficient to generally describe those features of the project that could be subject to the jurisdiction of federal and/or state agencies, such as the United States Army Corps of Engineers (USACE), CDFW, Regional Water Quality Control Board (RWQCB) and the State Water Resources Control Board (SWRCB).

II. Existing Conditions

Regional Setting

Topography

The topography of the site is relatively flat with an elevation of approximately 90 feet above mean sea level (MSL).

Climate

Like most of California, the project area experiences a Mediterranean climate. Warm, dry summers are followed by cool, moist winters. In the summer, average high temperatures range between 85- and 95-degrees Fahrenheit (°F), but often exceed 95 °F, and the humidity is generally low. Winter temperatures are often below 60 °F during the day and rarely exceed 70 °F. On average, the San Joaquin Valley receives approximately 12 inches of precipitation in the form of rainfall yearly, most of which occurs between October and March, and the project area would be expected to receive similar amounts of precipitation.

Hydrology

A watershed is the topographic region that drains into a stream, river, or lake. Watersheds are made up of many smaller subwatersheds that drain into a particular stream, river, or lake. The project site lies within the Mud Slough-San Joaquin River watershed; Hydrologic Unit Code (HUC): 1804000121 and the Sand Slough-San Joaquin River subwatershed; HUC: 180400012101. The nearest surface water to the project is Mariposa Slough which runs through the project site.

Mariposa Slough receives water from the Eastside Bypass. The Eastside Bypass receives water from a section of the San Joaquin River near Mendota and also from the Fresno River, Dry Creek, Berenda Slough, and the Chowchilla River. Downstream of the project site, Mariposa Slough connects back to the San Joaquin River near the San Luis National Wildlife Refuge, and the San Joaquin River continues northwest to the San Joaquin-Sacramento River Delta, near Stockton.

Soils

Eight soil mapping units representing four soil types were identified within the project site and are listed in **Table 1**, below (see **Appendix D** for the Web Soil Survey Report). The soils in Table 1 are displayed with their core properties, according to the Major Land Resource Area of California. All eight soils are primarily used for agriculture, grazing, and pasture.

Table 1. List of Soils Located Within the Project Site and Their Basic Properties

Soil	Soil Map Unit	Percent of Project Site	Hydric Soil Category	Drainage	Permeability	Runoff
Merced	Clay loam, slightly saline, 0 to 1 percent slopes	39.9%	Hydric	Somewhat poorly drained	Slow permeability	High runoff
	Silt loam, overwashed, slightly saline, 0 to 1 percent slopes	3.9%	Hydric	Somewhat poorly drained	Slow permeability	Medium runoff
Rossi	Clay loam, strongly saline-alkali, 0 to 1 percent slopes	1.3%	Hydric	Poorly drained	Very slow permeability	Very high runoff
	Clay loam, moderately saline-alkali, 0 to 1 percent slopes	1.4%	Hydric	Somewhat poorly drained	Moderately slow to slow permeability	Medium runoff
Temple	Loam, slightly saline, 0 to 1 percent slopes	31.0%	Hydric	Somewhat poorly drained	Moderately slow to slow permeability	Medium runoff
	Clay loam, slightly saline, 0 to 1 percent slopes	3.5%	Hydric	Somewhat poorly drained	Moderately high permeability	Medium runoff
Water	-	19%	-	-	-	-

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions such that under sufficiently wet conditions, hydrophytic vegetation can be supported. All soils are rated hydric.

Biotic Habitats

Three biotic habitats were observed within the project area and included ruderal, riverine, and agricultural (see **Figure 4**). These habitats and their constituent plant and animal species are described in more detail in the following sections.

Ruderal

The ruderal habitat within the project area consists primarily of dirt access roads along the banks of the Mariposa Slough. This habitat supported various plant species such as alkali mallow (*Malvella leprosa*), bristly oxtongue (*Helminthotheca echioides*), brome (*Bromus* sp.), field bindweed (*Convolvulus arvensis*), flax-leaved horseweed (*Conyza bonariensis*), milk thistle (*Silybum marianum*), poison hemlock (*Conium maculatum*), sea clubrush (*Bolboschoenus maritimus*), and Tex-Mex tobacco (*Nicotiana plumbaginifolia*).

Bird species such as mourning dove (*Zenaidura macroura*) and red-tailed hawk (*Buteo jamaicensis*) were seen foraging over this habitat at the time of the survey. Other disturbance tolerant bird species such as northern

mockingbirds (*Mimus polyglottos*) and house finches (*Carpodacus mexicanus*) could be expected to utilize these ruderal lands, as well as killdeer (*Charadrius vociferus*), which could nest on the ground in this habitat.

Riverine

The riverine habitat within the project area occurred primarily within Mariposa Slough and was dominated by broadleaf cattail (*Typha latifolia*), floating primrose-willow (*Ludwigia peploides*), hardstem bulrush (*Schoenoplectus acutus*), and sea clubrush (*Bolboschoenus maritimus*). Approximately 100 red-winged blackbirds (*Agelaius phoeniceus*) were observed within the emergent vegetation throughout the project area.

Predatory wading birds such as great blue heron (*Ardea herodias*) and great egret (*Ardea alba*) were observed foraging in this habitat. Cliff swallow (*Petrochelidon pyrrhonota*) nesting activity was also observed under a small bridge over the Mariposa Slough within the project area.

This habitat could potentially provide value to a variety of wildlife. Amphibians such as the Sierran tree frog (*Pseudacris sierra*) and western toad (*Anaxyrus boreas*) could breed in this habitat, and there is prominent soil cracking in the northwestern corner of the site which could support western spadefoot (*Spea hammondi*). It could also potentially support western pond turtle (*Actinemys marmorata*) or fish species common to the San Joaquin Valley.

Agricultural

At the time of the survey, the portion of the project area which consisted of an agricultural field was planted with tomato (*Solanum lycopersicum*). Other fields in the surrounding area were growing common wheat (*Triticum aestivum*) and onion (*Allium cepa*). Red-winged blackbirds were seen foraging within the agricultural fields. A pair of Swainson's hawks (*Buteo swainsoni*) were also seen exhibiting foraging behavior over the agricultural land in the area. Similar species could be expected to utilize this habitat as the species expected to use the ruderal habitat within the project area.

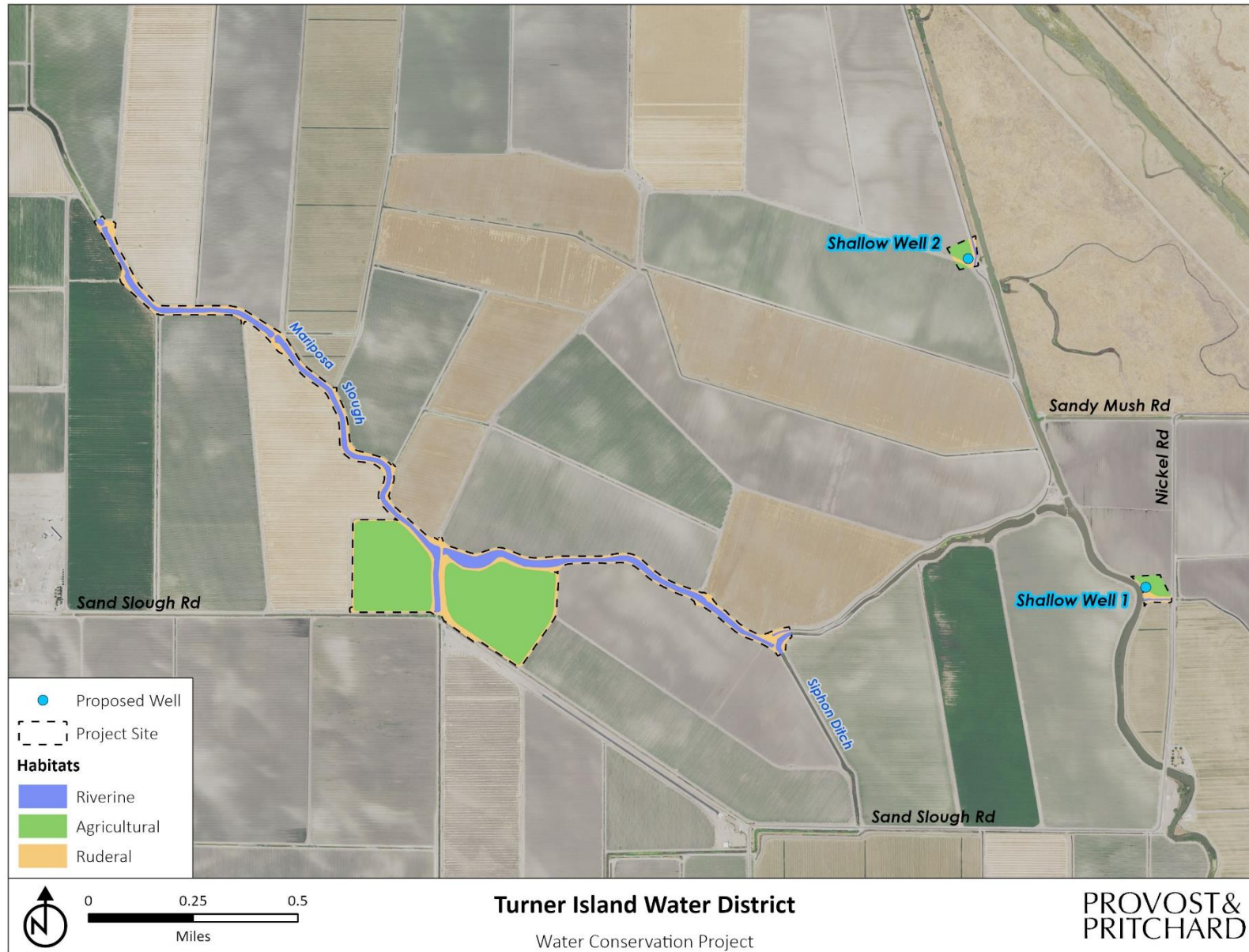


Figure 4. Habitats Map

Natural Communities of Special Concern and Riparian Habitat

Natural communities of special concern are those that are of limited distribution, distinguished by significant biological diversity, or home to special status species. CDFW has mapped and classified natural communities of special concern in California. Just as the special status plant and animal species, these natural communities of special concern can be found within the CNDDDB. No natural communities of special concern were found within the project site CNDDDB query (see Special Status Plants and Animals, below) or observed during the field survey.

Riparian habitat is composed of plant communities that occur along the banks, and sometimes over the banks, of most waterways and is an important habitat for numerous wildlife species. CDFW has jurisdiction over most riparian habitat in California. Riparian habitat was observed in Mariposa Slough in various areas within the riverine habitat of the project site. It consisted primarily of aquatic emergent vegetation such as broadleaf cattail and hardstem bulrush.

Designated Critical Habitat

The USFWS often designates areas of “critical habitat” when it lists species as threatened or endangered. Critical habitat is a specific geographic area that contains features essential for the conservation of a threatened or endangered species, which may require special management and protection. According to the CNDDDB and IPaC, designated critical habitat is absent from the project area and vicinity.

Wildlife Movement Corridors and Native Wildlife Nursery Sites

Wildlife movement corridors are routes that animals regularly and predictably follow during seasonal migration, dispersal from native ranges, daily travel within home ranges, and inter-population movements. Movement corridors in California are typically associated with valleys, ridgelines, and rivers and creeks supporting riparian vegetation. Mariposa Slough could potentially act as a wildlife movement corridor for migratory fish, birds and small mammals, as the project area lies between the San Luis National Wildlife Refuge and the Merced National Wildlife Refuge and connects the Eastside Bypass to the San Joaquin River.

Native wildlife nursery sites are areas where a species or group of similar species raise their young in a concentrated place, such as maternity bat roosts. No native wildlife nursery sites were found within the project site.

Special Status Animals and Plants

California contains several rare animal and plant species. In this context, “rare” is defined as species known to have low populations or limited distributions. As the human population grows, urban expansion encroaches on the already-limited suitable habitat for rare species. This results in sensitive species becoming increasingly more vulnerable to extirpation. State and federal regulations have provided the CDFW and USFWS with a mechanism for conserving and protecting the diversity of animal and plant species native to California. Numerous native animals and plants have been formally designated as “threatened” or “endangered” under state and federal endangered species legislation. Other formal designations include “candidate” for listing or “species of special concern” by CDFW. The CNPS has its list of native plants considered rare, threatened, or endangered. Collectively these animals and plants are referred to as “special status species.”

A query of the CNDDDB for occurrences of special status plant and animal species was conducted for the *San Luis Ranch* and *Turner Ranch* 7.5-minute U.S. Geological Survey (USGS) quadrangles that contain the project site, and for the 10 surrounding USGS quadrangles: *Arena*, *Atwater*, *Delta Ranch*, *Gustine*, *Ingomar*, *Los Banos*, *Sandy Mush*, *Santa Rita Bridge*, *Stevinson*, and *Volta*. These species, and their potential to occur within the project site,

are listed in **Table 2** and **Table 3** on the following pages. Other special status species that did not show up in the CNDDDB query, but have the potential to occur in the vicinity, are also included in Table 2. Species lists obtained from CNDDDB and IPaC are available in **Appendix B** and **Appendix C**, respectively. All relevant sources of information, as discussed in the *Study Methodology* section of this report, as well as field observations, were used to determine if any special status species are known to be within the project site.

Table 2. List of Special Status Animals with Potential to Occur Within the Project Site and/or in the Vicinity

Species	Status*	Habitat	Occurrence Within the Project Site
American Badger (<i>Taxidea taxus</i>)	CSSC	Grasslands, savannas, and mountain meadows near timberline are preferred. Most abundant in drier open spaces of shrub and grassland. Burrows in soil.	Absent. The project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately five miles southwest of the project site in 1930.
Blunt-nosed Leopard Lizard (<i>Gambelia sila</i>)	FE, CE, CFP	Inhabits semi-arid grasslands, alkali flats, low foothills, canyon floors, large washes, and arroyos, usually on sandy, gravelly, or loamy substrate, sometimes on hardpan. Often found where there are abundant rodent burrows in dense vegetation or tall grass. Cannot survive on lands under cultivation. Known to bask on kangaroo rat mounds and often seeks shelter at the base of shrubs, in small mammal burrows, or in rock piles. Adults may excavate shallow burrows but rely on deeper pre-existing rodent burrows for hibernation and reproduction.	Absent. The project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately seven miles southeast of the project site in 1967.
Burrowing Owl (<i>Athene cunicularia</i>)	CSSC	Resides in open, dry annual or perennial grasslands, deserts, and scrublands with low growing vegetation. Nests underground in existing burrows created by mammals, most often ground squirrels. Can also be found in human-made structures, such as pipes.	Unlikely. The project site lacks the preferred foraging habitat of this species. No evidence of this species or burrows which could be utilized by this species were observed during the field survey. The nearest recorded observation of this species occurred approximately nine miles east of the project site in 2007.
California Tiger Salamander (<i>Ambystoma californiense</i>)	FT, CT	Requires vernal pools or seasonal ponds for breeding and small mammal burrows for aestivation. Generally found in grassland and oak savannah plant communities in central California from sea level to 1500 feet in elevation. Can migrate up to 1.3 miles to breed.	Unlikely. The project area lacks quality breeding habitat for this species. Seasonal ponding within the site appears to occur due to overflow from the slough, which would likely wash out, or introduce predators of, this species. The nearest recorded observation of this species occurred in San Luis National Wildlife Refuge, approximately 0.5 miles west of the project site, in 1993.

Species	Status*	Habitat	Occurrence Within the Project Site
Coast Horned Lizard (<i>Phrynosoma blainvillii</i>)	CSSC	Found in grasslands, coniferous forests, woodlands, and chaparral, primarily in open areas with patches of loose, sandy soil and low-lying vegetation in valleys, foothills, and semi-arid mountains. Frequently found near ant hills and along dirt roads in lowlands along sandy washes with scattered shrubs.	Absent. The project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately five miles north of the project site in 1989.
Conservancy Fairy Shrimp (<i>Branchinecta conservatio</i>)	FE	Endemic to the grasslands of the northern two-thirds of the Central Valley. Found in large, turbid pools.	Unlikely. The project area lacks quality breeding habitat for this species. Seasonal ponding within the site appears to occur due to overflow from the slough, which would likely wash out, or introduce predators of, this species. The nearest recorded observation of this species occurred approximately two miles north of the project site in 2015.
Crotch Bumble Bee (<i>Bombus crotchii</i>)	CCE	Inhabits open grassland and scrub habitats. Food plant genera include <i>Antirrhinum</i> , <i>Phacelia</i> , <i>Clarkia</i> , <i>Dendromecon</i> , <i>Eschscholzia</i> , and <i>Eriogonum</i> .	Absent. The project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately 12.5 miles south of the project site in 1952.
Fresno Kangaroo Rat (<i>Dipodomys nitratoides exilis</i>)	FE, CE	An inhabitant of alkali sinks and open grassland habitats in Merced, Kings Fresno, and Madera counties. Prefers bare, alkaline, clay-based soils subject to seasonal inundation with more friable soil mounds around shrubs and grasses. The most recent recorded observation of this species in California was in 1992 in Fresno County.	Unlikely. The project site lacks the preferred habitat of this species. There are no recorded observations of this species within the 12-quadrant CNDDDB search.
Giant Gartersnake (<i>Thamnophis gigas</i>)	FT, CT	Occurs in marshes, sloughs, drainage canals, irrigation ditches, rice fields, and adjacent uplands. Prefers locations with emergent vegetation for cover and open areas for basking. This species uses small mammal burrows adjacent to aquatic habitats for hibernation in the winter and to escape from excessive heat in the summer.	Unlikely. Mariposa Slough provides suitable foraging habitat for this species, however small mammal burrows required by this species were absent from the site. The nearest recorded observation of this species occurred in San Luis National Wildlife Refuge, approximately 0.5 miles west of the project site, in 1974.
Golden Eagle (<i>Aquila chrysaetos</i>)	CFP	This species typically nests on cliff ledges or large trees, rarely on the ground. They prefer an expanse of open terrain and are found over tundra, prairie, rangeland, desert, and grasslands.	Possible. This species could potentially nest within several trees large eucalyptus trees adjacent to the northern boundary of the project area.

Species	Status*	Habitat	Occurrence Within the Project Site
			The nearest recorded observation of this species occurred approximately 13.5 miles southwest of the project site in 1987.
Green Sturgeon - Southern DPS (<i>Acipenser medirostris</i>)	FT	Spawns in Sacramento, Feather, and Yuba Rivers. Presence in upper Stanislaus and San Joaquin Rivers may indicate spawning. Non-spawning adults occupy marine/estuarine waters. Delta estuaries are important for rearing juveniles.	Absent. This species could not occur within Mariposa Slough because there are no accessible connections to the San Joaquin River. The nearest recorded observation of this species occurred in the San Joaquin River, approximately 12.5 miles northwest of the project site in 2020.
Hardhead (<i>Mylopharodon conocephalus</i>)	CSSC	Occurs in low- to mid-elevation streams in the Sacramento-San Joaquin river drainages. Clear, deep pools with sand-gravel-boulder bottoms and slow-moving water are required. This species is often sympatric with Sacramento pikeminnow and Sacramento sucker. Hardhead are typically absent from streams occupied by centrarchids and from heavily altered habitats.	Unlikely. The project site lacks the specific habitat requirements of this species. The nearest recorded observation of this species occurred approximately three miles north of the project site in Bear Creek, East Side Canal, Atwater Drain, and adjacent freshwater ponds in 1989.
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	CSSC	Frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low herbaceous cover. In the Central Valley, nests in riparian areas, desert scrub, and agricultural hedgerows.	Possible. Suitable nesting and foraging habitat for this species is present within the project area. The nearest recorded observation of this species occurred approximately eight miles west of the project site in 2014.
Longhorn Fairy Shrimp (<i>Branchinecta longiantenna</i>)	FE	Inhabits clear to turbid vernal pools or seasonally ponded areas.	Unlikely. The project area lacks high quality breeding habitat for this species. Seasonal ponding within the site appears to occur due to overflow from the slough, which would likely wash out, or introduce predators of, this species. The nearest recorded observation of this species occurred in the vicinity of San Luis National Wildlife Reserve in 2008.
Monarch Butterfly (<i>Danaus plexippus</i>)	FC	Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby. Larval host plants consist of milkweeds (<i>Asclepias</i> sp.). Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico.	Unlikely. The project site lacks high quality food sources, larval host plants, and suitable roost sites. There are no recorded observations of this species within the 12-quad CNDDDB search.

Species	Status*	Habitat	Occurrence Within the Project Site
Northern California Legless Lizard (<i>Anniella pulchra</i>)	CSSC	Found primarily underground, burrowing in loose, sandy soil. Forages in loose soil and leaf litter during the day. Occasionally observed on the surface at dusk and night.	Absent. The project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately five miles north of the project site in 2009.
Northern Harrier (<i>Circus hudsonius</i>)	CSSC	Nests and forges in various grasslands, including salt grass in desert sinks, riparian scrub, and wetland edges. Nests are constructed on the ground from sticks in wet areas, usually on the edge of marshes.	Possible. This species could nest in emergent vegetation within the project area and forage in nearby grasslands. The nearest recorded observation of this species occurred within San Luis National Wildlife Refuge in 1972.
Northern Leopard Frog (<i>Lithobates pipiens</i>)	CSSC	Inhabits grassland, wet meadows, potholes, forests, woodland, brushlands, springs, canals, bogs, marshes, and reservoirs. Generally, prefers permanent water with abundant riparian vegetation.	Unlikely. The project area lacks the preferred habitat of this species. The nearest recorded observation of this species occurred approximately one mile east of the project site in 1976.
Pallid Bat (<i>Antrozous pallidus</i>)	CSSC	Found in grasslands, chaparral, and woodlands, where it feeds on ground- and vegetation-dwelling arthropods, and occasionally takes insects in flight. Prefers to roost in rock crevices, but may also use tree cavities, caves, bridges, and other man-made structures.	Unlikely. The project site lacks high quality roosting habitat for this species. The nearest recorded observation of this species occurred approximately 15 miles northwest of the project site in 1999.
San Joaquin Kit Fox (<i>Vulpes macrotis mutica</i>)	FE, CT	Uses underground dens with multiple entrances in alkali sink, valley grassland, and woodland habitats in valleys and adjacent foothills.	Unlikely. The project site lacks suitable habitat for this species. This species could potentially pass through the project site. The nearest recorded observation of this species occurred approximately one mile northwest of the project site in 1975.
Steelhead – Central Valley DPS (<i>Oncorhynchus mykiss irideus</i> pop.11)	FT	This winter-run fish begins migration to fresh water during peak flows during December and February. Spawning season is typically from February to April. After hatching, they move to deeper, mid-channel habitats in late summer and fall. In general, both juveniles and adults prefer complex habitat with boulders, submerged clay and undercut banks, and large woody debris.	Absent. This species could not occur within Mariposa Slough because there are no accessible connections to the San Joaquin River. The nearest recorded observation of this species occurred in the San Joaquin River, just west of the project site, in 2013.
Swainson's Hawk (<i>Buteo swainsoni</i>)	CT	Nests in large trees in open areas adjacent to grasslands, grain or alfalfa fields, or livestock pastures	Possible. A pair was observed flying over the project site. This species could potentially nest within

Species	Status*	Habitat	Occurrence Within the Project Site
		suitable for supporting rodent populations.	several trees large eucalyptus trees adjacent to the northern boundary of the project area. The nearest recorded observation of this species occurred approximately 0.25 miles northwest of the project site in 1988.
Tricolored Blackbird (<i>Agelaius tricolor</i>)	CT, CSSC	Nests colonially near fresh water in dense cattails or tules, or in thickets of riparian shrubs. Forages in grassland and cropland. Large colonies are often found on dairy farm forage fields.	Possible. The project site contains suitable nesting and foraging habitat for this species. The nearest recorded observation of this species occurred approximately one mile east of the project site in 1987.
Valley Elderberry Longhorn Beetle (<i>Desmocerus californicus dimorphus</i>)	FT	Lives in mature elderberry shrubs of the Central Valley and foothills. Adults are active from March to June.	Absent. The project site lacks suitable habitat for this species. No elderberry shrubs were observed during the field survey. There are no recorded observations of this species within the 12-quad CNDDDB search.
Vernal Pool Fairy Shrimp (<i>Branchinecta lynchi</i>)	FT	Occupies vernal pools, with clear to tea-colored water, in grass or mud-bottomed swales, and basalt depression pools.	Unlikely. The project area lacks quality breeding habitat for this species. Seasonal ponding within the site appears to occur due to overflow from the slough, which would likely wash out, or introduce predators of, this species. The nearest recorded observation of this species occurred approximately one mile north of the project site in 2015.
Vernal Pool Tadpole Shrimp (<i>Lepidurus packardii</i>)	FE	Occurs in vernal pools, with clear to tea-colored water, in grass or mud-bottomed swales, and basalt depression pools.	Unlikely. The project area lacks high quality breeding habitat for this species. Seasonal ponding within the site appears to occur due to overflow from the slough, which would likely wash out, or introduce predators of, this species. The nearest recorded observations of this species occurred within San Luis National Wildlife Refuge, west of the project site, in 1993.
Western Pond Turtle (<i>Emys marmorata</i>)	CSSC	An aquatic turtle of ponds, marshes, slow-moving rivers, streams, and irrigation ditches with riparian vegetation. Requires adequate basking sites and sandy banks or grassy open fields to deposit eggs.	Possible. Suitable nesting and foraging habitat for this species is present within the project area. The nearest recorded observation of this species occurred approximately

Species	Status*	Habitat	Occurrence Within the Project Site
			two miles northwest of the project site in 2002.
Western Red Bat (<i>Lasiurus blossevillei</i>)	CSSC	Roosts primarily in trees from sea level up through mixed conifer forests. Typically found in mature cottonwoods, sycamores, and oaks. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	Unlikely. The project area lacks the preferred habitat of this species. The nearest recorded observation of this species occurred approximately 15.5 miles northwest of the project site in 1999.
Western Spadefoot (<i>Spea hammondi</i>)	CSSC	The majority of the time this species is terrestrial and occurs in small mammal burrows and soil cracks, sometimes in the bottom of dried pools. Prefers open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Vernal pools or temporary wetlands, lasting a minimum of three weeks, which do not contain bullfrogs, fish, or crayfish are necessary for breeding.	Possible. This species could potentially breed in nearby vernal pools and be found in the soil cracks within the project area. The nearest recorded observations of this species occurred within San Luis National Wildlife Refuge, west of the project site, in 1993.
Yellow Rail (<i>Coturnicops noveboracensis</i>)	CSSC	This species requires densely vegetated sedge marshes or meadows with moist soil or shallow standing water to breed. There are small, isolated breeding populations of this species in northern California.	Unlikely. The project site is outside of the current known range of this species. The nearest recorded observation of this species occurred approximately 10 miles southwest of the project site in 1911.

Table 3. List of Special Status Plants with Potential to Occur Within the Project Site and/or in the Vicinity

Species	Status*	Habitat	Occurrence Within the Project Site
Alkali Milk-vetch (<i>Astragalus tener</i> var. <i>tener</i>)	CNPS 1B	Found in alkali soils in the San Joaquin Valley and throughout the San Francisco Bay Delta region of California in low and flooded areas at elevation below approximately 200 feet. Blooms March – June.	Possible. The project site contains suitable alkali soils for this species. This species could potentially occur in the riverine habitat within the project area. The nearest recorded observation of this species occurred approximately four miles north of the project site in 1994.
Alkali-sink Goldfields (<i>Lasthenia chrysanthra</i>)	CNPS 1B	Found in vernal pool and wet saline flat habitats. Occurrences documented in the Central Valley at elevations below approximately 700 feet. Blooms February - April.	Possible. The project site contains suitable alkali soil for this species. This species could potentially occur in the riparian portion of the riverine habitat within the project area. The nearest recorded observation of this species occurred approximately 3.5 miles north of the project site in 2008.
Brittlescale (<i>Atriplex depressa</i>)	CNPS 1B	Found in the Central Valley in alkaline or clay soils, typically in meadows or annual grassland at elevations below approximately 1,100 feet. Sometimes associated with vernal pools. Blooms June–October.	Unlikely. There are no meadows or annual grassland habitats within the site. The nearest recorded observation of this species occurred approximately 3.5 miles north of the project site in 1992.
California Alkali Grass (<i>Puccinellia simplex</i>)	CNPS 1B	Found in the San Joaquin Valley and other parts of California in saline flats and mineral springs within valley grassland and wetland-riparian communities at elevations below 3,000 feet. Blooms March–May.	Unlikely. The project site does not contain saline flats or mineral springs. The nearest recorded observation of this species occurred approximately six miles south of the project site in 1978.
Colusa Grass (<i>Neostapfia colusana</i>)	FT, CE, CNPS 1B	Found in vernal pools in the San Joaquin Valley at elevations below approximately 500 feet. Blooms May – August.	Absent. The project site lacks suitable vernal pool habitat. The nearest recorded observation of this species occurred approximately 2.5 miles north of the project site in 2001.
Coulter's Goldfields (<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>)	CNPS 1B	Found on alkaline or saline soils in vernal pools and playas in grassland at elevations below 4,500 feet. Blooms April–May.	Unlikely. The project site lacks suitable vernal pool habitat. The nearest recorded observation of this species occurred approximately four miles north of the project site in 2002.

Species	Status*	Habitat	Occurrence Within the Project Site
Delta Button-celery (<i>Eryngium racemosum</i>)	CE, CNPS 1B	Found in seasonally flooded clay depressions in floodplains at elevations between approximately 10 and 100 feet. Blooms June – August.	Possible. This species could occur within the riverine habitat within the project site. The nearest recorded observation of this species occurred approximately 0.25 miles from the project site in 1986.
Heartscale (<i>Atriplex cordulata</i> var. <i>cordulata</i>)	CNPS 1B	Found in the Central Valley in saline or alkaline soils within shadescale scrub, valley grassland, and wetland-riparian communities at elevations below approximately 300 feet. Blooms June–July.	Possible. The project site contains suitable saline and alkaline soils for this species. This species could potentially occur within the riparian portion of the riverine habitat within the project area. The nearest recorded observation of this species occurred approximately two miles northeast of the project site in 1998.
Heckard's Pepper-grass (<i>Lepidium latipes</i> var. <i>heckardii</i>)	CNPS 1B	Facultative wetland plant species which grows at elevations below approximately 3,000 feet. Found in alkaline soils in valley and foothill grasslands as well as vernal pools. Blooms March – June.	Possible. The project site contains suitable saline and alkaline soils for this species. This species could potentially occur within the riverine habitat within the project area. The nearest recorded observation of this species occurred approximately four miles north of the project site in 2002.
Hispid Salty Bird's-beak (<i>Chloropyron molle</i> ssp. <i>hispidum</i>)	CNPS 1B	Grows in the damp, alkali soils of meadows, playas, and sinks in the San Joaquin Valley and Delta-Bay region of California. Found at elevations below approximately 500 feet. Blooms June – July.	Possible. The project site contains suitable saline and alkaline soils for this species. This species could potentially occur within the riverine habitat within the project area. The nearest recorded observation of this species occurred approximately three miles west of the project site in 1986.
Hoover's Spurge (<i>Euphorbia hooveri</i>)	FT, CNPS 1B	Found in the Central Valley in vernal pools within valley grassland, freshwater wetland, and riparian communities at elevations below 800 feet. Blooms July – September.	Possible. This species could potentially occur within the riparian portion of the riverine habitat within the project area. The nearest recorded observation of this species occurred approximately 2.5 miles north of the project site in 1987.
Lesser Saltscale (<i>Atriplex minuscula</i>)	CNPS 1B	Found in the San Joaquin Valley in sandy, alkaline soils in alkali scrub, valley and foothill grassland, and alkali sink communities at elevations below 750 feet. Blooms April – October.	Absent. The project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately five miles east of the project site in 2017.

Species	Status*	Habitat	Occurrence Within the Project Site
Northern Slender Pondweed (<i>Stuckenia filiformis</i> ssp. <i>alpina</i>)	CNPS 2B	Found in shallow, clear water of lakes and drainage channels at elevations between 15 feet and 7,500 feet. Blooms May - July. Found primarily in the central High Sierra Nevada and San Francisco Bay regions.	Absent. The project site is outside of the current known range of this species. The nearest recorded observation of this species occurred approximately 11.5 miles west of the project site in 1948.
Prostrate Vernal Pool Navarretia (<i>Navarretia prostrata</i>)	CNPS 1B	Found in the San Joaquin Valley as well as areas along the central and southern coast of California. Grows in a variety of grassland and wetland habitats in mesic, alkaline soils at elevations below 2,300 feet. Blooms April – July.	Possible. The project site contains suitable alkaline soil for this species. This species could potentially occur in the riparian portion of the riverine habitat within the project area. The nearest recorded observation of this species occurred approximately 2.5 miles west in 1999.
Recurved Larkspur (<i>Delphinium recurvatum</i>)	CNPS 1B	Occurs in poorly drained, fine, alkaline soils in grassland and alkali scrub communities at elevations between 100 feet and 2,600 feet. Blooms March–June.	Absent. The project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately eight miles east of the project site in 1998.
San Joaquin Spearscale (<i>Extriplex joaquinana</i>)	CNPS 1B	Found in alkali wetlands, sinks, and scrublands in the San Joaquin Valley and Delta-Bay region of California. Associated with <i>Distichlis spicata</i> , <i>Frankenia</i> , and other scrub species at elevations below 1,150 feet. Blooms April – September.	Possible. The project site contains suitable soil for this species. This species could potentially occur in the riverine habitat within the project area. The nearest recorded observation of this species occurred approximately 3.5 miles north of the project site in 2002.
Sanford's Arrowhead (<i>Sagittaria sanfordii</i>)	CNPS 1B	Found in the San Joaquin Valley and other parts of California in freshwater-marsh, primarily ponds and ditches, at elevations below 1,000 feet. Blooms May–October.	Possible. There is suitable habitat for this species within the project site. The nearest recorded observation of this species occurred approximately one mile north of the project site in 1948.
Spiny-sealed Button-celery (<i>Eryngium spinosepalum</i>)	CNPS 1B	Found in the foothills of the Sierra Nevada and the San Joaquin Valley. Occurs in vernal pools, swales, and roadside ditches. Often associated with clay soils in vernal pools within grassland communities. Occurs at elevations between approximately 50 feet and 4,200 feet. Blooms April–July.	Unlikely. The project site lacks suitable vernal pool habitat for this species. The nearest recorded observation of this species occurred approximately 5.5 miles southwest of the project site in 1948.

Species	Status*	Habitat	Occurrence Within the Project Site
Subtle Orache (<i>Atriplex subtilis</i>)	CNPS 1B	Found in the San Joaquin Valley in saline depressions in alkaline soils within valley and foothill grassland communities at elevations below 330 feet. Blooms June–October.	Absent. The project site lacks suitable habitat for this species. This species is not known to occur in this region of the San Joaquin Valley. The nearest recorded observation of this species occurred approximately 10 miles east of the project site in 1936.
Vernal Pool Smallscale (<i>Atriplex persistens</i>)	CNPS 1B	Occurs in the Central Valley in alkaline vernal pools at elevations below 375 feet. Blooms June–September.	Absent. The project site lacks suitable habitat for this species. The nearest recorded observation of this species occurred approximately three miles north of the project site in 2011.
Wright's Trichocoronis (<i>Trichocoronis wrightii</i> var. <i>wrightii</i>)	CNPS 2B	Found in marshes and swamps, riparian forest, meadows and seeps, vernal pools, mud flats of vernal lakes, drying riverbeds, and alkali meadows at elevations between approximately 15 feet and 1,450 feet. Blooms May - September.	Possible. Suitable habitat for this species is present at the project site. This species could occur in the riparian portion of the riverine habitat. The nearest recorded observation of this species occurred approximately 1.5 miles east of the project site in 2017.

***EXPLANATION OF OCCURRENCE DESIGNATIONS AND STATUS CODES**

Present:	Species observed on the project site at time of field surveys or during recent past.
Likely:	Species not observed on the project site, but it may reasonably be expected to occur there on a regular basis.
Possible:	Species not observed on the project site, but it could occur there from time to time.
Unlikely:	Species not observed on the project site, and would not be expected to occur there except, perhaps, as a transient.
Absent:	Species not observed on the project site and precluded from occurring there due to absence of suitable habitat.

STATUS CODES

FE	Federally Endangered	CE	California Endangered
FT	Federally Threatened	CCE	California Endangered (Candidate)
FC	Federal Candidate	CT	California Threatened
		CFP	California Fully Protected
		CSSC	California Species of Special Concern

CNPS LISTING

1B	Plants rare, threatened, or endangered in California and elsewhere.	2B	Plants rare, threatened, or endangered in California, but more common elsewhere.
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III. Impacts and Mitigation

Significance Criteria

CEQA

General plans, area plans, and specific projects are subject to the provisions of CEQA. The purpose of CEQA is to assess the impacts of proposed projects on the environment prior to project implementation. Impacts to biological resources are just one type of environmental impact assessed under CEQA and vary from project to project in terms of scope and magnitude. Projects requiring removal of vegetation may result in the mortality

or displacement of animals associated with this vegetation. Animals adapted to humans, roads, buildings, and pets may replace those species formerly occurring on a site. Plants and animals that are rare may be destroyed or displaced. Sensitive habitats such as wetlands and riparian woodlands may be altered or destroyed. Such impacts may be considered either “significant” or “less than significant” under CEQA. According to *CEQA Statute and Guidelines* (AEP 2023), “significant effect on the environment” means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic interest. Specific project impacts to biological resources may be considered “significant” if they would:

- 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 CDFW or USFWS;
- 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 CDFW or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (CWA) (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- 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.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state HCP.

Furthermore, CEQA Guidelines Section 15065(a) states that a project may trigger the requirement to make a “mandatory finding of significance” if the project has 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, reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory.”

Relevant Goals, Policies, and Laws

Merced County General Plan

The Merced County General Plan Policy Document contain the following goals and policies related to the project:

Biological Resources

Policy NR-1.1: Habitat Protection

Identify areas that have significant long-term habitat and wetland values including riparian corridors, wetlands, grasslands, rivers and waterways, oak woodlands, vernal pools, and wildlife movement and migration corridors, and provide information to landowners.

Policy NR-1.2: Protected Natural Lands

Identify and support methods to increase the acreage of protected natural lands and special habitats, including but not limited to, wetlands, grasslands, vernal pools, and wildlife movement and migration corridors, potentially through the use of conservation easements.

Policy NR-1.5: Wetland and Riparian Habitat Buffer

Identify wetlands and riparian habitat areas and designate a buffer zone around each area sufficient to protect them from degradation, encroachment, or loss.

Water Supply**Policy W-1.4: Groundwater Recharge Projects**

Support implementation of groundwater recharge projects consistent with adopted Integrated Regional Water Management Plans to minimize overdraft of groundwater and ensure the long-term availability of groundwater.

Policy W-1.5: New Well Guidelines

Support implementation of groundwater recharge projects consistent with adopted Integrated Regional Water Management Plans to minimize overdraft of groundwater and ensure the long-term availability of groundwater.

Water Quality**Policy W-2.1: Water Resource Protection**

Ensure that land uses and development on or near water resources will not impair the quality or productive capacity of these water resources.

Policy W-2.2: Development Regulations to Protect Water Quality

Prepare updated development regulations, such as best management practices, that prevent adverse effects on water resources from construction and development activities.

Policy W-2.6: Wellhead Protection Program

Enforce the wellhead protection program to protect the quality of existing and future groundwater supplies by monitoring the construction, deepening, and destruction of all wells within the County.

Water Reuse and Conservation**Policy W-3.3: Water System Rehabilitation**

Encourage the rehabilitation of irrigation systems and other water delivery systems to reduce lost water and increase the efficient use and availability of water.

Policy W-3.14: Agricultural Water Conservation

Encourage farmers to use irrigation methods which conserve water in areas where flood irrigation is used for groundwater recharge.

Threatened and Endangered Species

Permits may be required from CDFW and/or USFWS if activities associated with a project have the potential to result in the “take” of a species listed as threatened or endangered under the California Endangered Species Act (CESA) and/or Endangered Species Act (ESA), respectively. Take is defined by CESA as, “to hunt, pursue,

catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill” (California Fish and Game Code, Section 86). Take is more broadly defined by the ESA to include “harm” (16 USC, Section 1532(19), 50 CFR, Section 17.3). CDFW and USFWS are responsible agencies under CEQA. Both agencies review CEQA documents in order to determine the adequacy of the treatment of endangered species issues and to make project-specific recommendations for their conservation.

Designated Critical Habitat

When species are listed as threatened or endangered, the USFWS often designates areas of “critical habitat” as defined by section 3(5)(A) of the ESA. Critical habitat is a term defined in the ESA as a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat is a tool that supports the continued conservation of imperiled species by guiding cooperation with the federal government. Designations only affect federal agency actions or federally funded or permitted activities. Critical habitat does not prevent activities that occur within the designated area. Only activities that involve a federal permit, license, or funding and are likely to destroy or adversely modify critical habitat will be affected.

Migratory Birds

The Migratory Bird Treaty Act (MBTA: 16 USC 703-712) prohibits killing, possessing, or trading in any bird species covered in one of four international conventions to which the United States is a party, except in accordance with regulations prescribed by the Secretary of the Interior. The name of the act is misleading, as it covers almost all bird’s native to the United States, even those that are non-migratory. The MBTA encompasses whole birds, parts of birds, and bird nests and eggs. Additionally, California Fish and Game Code makes it unlawful to take or possess any non-game birds covered by the MBTA (Section 3513), as well as any other native non-game birds (Section 3800).

Birds of Prey

Birds of prey are protected in California under provisions of California Fish and Game Code (Section 3503.5), which states that it is unlawful to take, possess, or destroy any birds in the order Falconiformes (hawks and eagles) or Strigiformes (owls), as well as their nests and eggs. The bald eagle and golden eagle are afforded additional protection under the Bald and Golden Eagle Protection Act (16 USC 668), which makes it unlawful to kill birds or their eggs, or take feathers or nests, without a permit issued by the U.S. Secretary of the Interior.

Nesting Birds

In California, protection is afforded to the nests and eggs of all birds. California Fish and Game Code (Section 3503) states that it is “unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided by this code or any regulation adopted pursuant thereto.” Breeding-season disturbance that causes nest abandonment and/or loss of reproductive effort is considered a form of “take” by the CDFW.

Wetlands and other “Jurisdictional Waters”

The definition of “waters of the United States” (WOTUS) often changes from one presidential administration to the next and can also be affected by the outcomes of court cases involving federal jurisdiction of waters. The current definition (i.e. “Conforming Rule”) was adopted under the Biden Administration in early 2023 and was subsequently revised in September 2023 to incorporate the U.S. Supreme Court’s May 25, 2023, decision in the case of *Sackett v. Environmental Protection Agency* (EPA). The Conforming Rule has adopted much of the same WOTUS designations as the pre-2015 rules but has incorporated the most recent science and court case rulings. The extent of jurisdiction has been defined in the Code of Federal Regulations (CFR) but is also subject to interpretation by the federal courts. Jurisdictional waters generally include the following categories:

- 1) Traditional Navigable Waters, the territorial seas, or interstate waters (not including interstate wetlands);
- 2) Impoundments of waters of the United States;
- 3) Tributaries of:
 - a. Traditional Navigable Waters, territorial seas, or interstate waters (not including interstate wetlands); or
 - b. Impoundments of water of the United States when the tributaries meet the relatively permanent standard.
- 4) Wetlands:
 - a. Adjacent to Traditional Navigable Waters, the territorial seas, or interstate waters;
 - b. Adjacent to and with a continuous surface connection to relatively permanent impoundments of waters of the United States
 - c. Adjacent to and with a continuous surface connection to relatively permanent jurisdictional tributaries.
- 5) Intrastate lakes and ponds not identified in items 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 items 1 or 3 above.

Exclusions under the new definition include the following:

- 1) Waste treatment systems, including treatment ponds or lagoons, designed to meet the requirements of the CWA;
- 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 CWA, the final authority regarding CWA jurisdiction remains with USEPA;
- 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.

The Conforming Rule has incorporated the best available science, relevant supreme court cases, public comment, technical expertise, and experience gained from more than 45 years of implementing the pre-2015 “waters of the United States” framework to inform jurisdictional limits. One significant court case involves the U.S. Supreme Court in its *2001 Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers (SWANCC)* decision. It was determined that channels and wetlands isolated from other jurisdictional waters cannot be considered jurisdictional on the basis of their use, hypothetical or observed, by migratory birds.

Similarly, in its 2006 consolidated *Carabell/Rapanos* decision, the United States Supreme Court ruled that a significant nexus between a wetland and other navigable waters must exist for the wetland itself to be considered a jurisdictional water. The Supreme Court heard *Sackett v. United States EPA* in May 2023, to determine governing standards of a significant nexus between waters of the United States and adjacent wetlands. The court decided that adjacent wetlands would be protected under the CWA only if it maintained a continuous surface water connection with a federal water body. This decision has limited protection for networks of wetlands connected to navigable waters through subsurface flow. The final decision was enacted in September 2023.

The USACE regulates the filling or grading of waters of the United States, under the authority of Section 404 of the CWA. The extent of jurisdiction within drainage channels is defined by “ordinary high-water marks” on opposing channel banks. All activities that involve the discharge of dredge or fill material into waters of the United States are subject to the permit requirements of the USACE. Such permits are typically issued on the condition that the applicant agrees to provide mitigation that results in no net loss of wetland functions or values. No permit can be issued until the RWQCB issues a Section 401 Water Quality Certification (or waiver of such certification) verifying that the proposed activity will meet state water quality standards.

Under the Porter-Cologne Water Quality Control Act of 1969, the SWRCB has regulatory authority to protect the water quality of all surface water and groundwater in California (“waters of the state”). Nine RWQCBs oversee water quality at the local and regional level. The RWQCB for a given region regulates discharges of fill or pollutants into waters of the state through the issuance of various permits and orders. Discharges into Waters of the State that are also WOTUS require a Section 401 Water Quality Certification from the RWQCB as a prerequisite to obtaining certain federal permits, such as a Section 404 Clean Water Act permit. Discharges into all Waters of the State, even those that are not also WOTUS, require waste discharge requirements (WDRs), or waivers of WDRs, from the RWQCB. The RWQCB also administers the Construction Storm Water Program and the federal National Pollution Discharge Elimination System (NPDES) program. Projects that disturb one acre or more of soil must obtain a Construction General Permit under the Construction Storm Water Program. A prerequisite for this permit is the development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer. Projects that discharge wastewater, storm water, or other pollutants into a WOTUS may require a NPDES permit.

CDFW has jurisdiction over the bed and bank of natural drainages and lakes according to provisions of Section 1601 and 1602 of the California Fish and Game Code. Activities that may substantially modify such waters through the diversion or obstruction of their natural flow, change or use any material from their bed or bank, or deposits debris within them require a notification of a Lake or Streambed Alteration. If CDFW determines that the activity may adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared. Such an agreement typically stipulates that certain avoidance and minimization measures will be implemented to protect the habitat values of the lake or drainage in question and the plant, fish, and wildlife species that may be present within these resources.

Potentially Significant Project-Related Impacts and Mitigation

Species protected by California Fish and Game Code, CDFW, USFWS, or CEQA that have the potential to be impacted by project activities include: golden eagle, migratory nesting birds, raptors and special status birds (i.e., loggerhead shrike, northern harrier, Swainson’s hawk, and tricolored blackbird), western pond turtle and western spadefoot, and various rare plants. Corresponding mitigation measures can be found below.

Project-Related Mortality and/or Nest Abandonment of Migratory Birds, Raptors, and Special Status Birds

The project area contains suitable nesting and foraging habitat for a variety of protected bird species, such as migratory birds, raptors, and special status birds (i.e., loggerhead shrike, northern harrier, Swainson's hawk, and tricolored blackbird). It is anticipated that during the nesting bird season, protected birds could nest on the ground, in emergent aquatic vegetation, shrubs, trees, or structures within the project area and forage within the project area. Protected birds located within or adjacent to the project area during construction have the potential to be injured or killed by project-related activities. In addition to the direct "take" of protected birds within the project area or adjacent areas, these birds nesting in these areas could be disturbed by project-related activities resulting in nest abandonment. Projects that adversely affect the nesting success of protected birds or result in the mortality of these birds would be a violation of state and federal laws and considered a potentially significant impact under CEQA.

While foraging habitat for protected birds is present on the site, suitable foraging habitat is located adjacent to the site and within the vicinity of the site. Loss of the foraging habitat from implementation of the Project is not considered a significant impact.

Mitigation. Implementation of the following measures will reduce potential impacts to protected nesting birds to a less than significant level under CEQA and will ensure compliance with state and federal laws protecting these bird species.

Mitigation Measure BIO-1a (*Avoidance*): The project's construction activities will occur, if feasible, between September 16 and January 31 (outside of the nesting bird season) to avoid impacts to nesting birds.

Mitigation Measure BIO-1b (*Pre-construction Surveys*): If activities must occur within nesting bird season (February 1 to September 15), a qualified biologist will conduct a pre-construction survey for Swainson's hawk nests onsite and up to a 0.5-mile radius within five calendar days prior to the start of construction. The Swainson's hawk survey will not be completed between April 21 to June 10 due to the difficulty of identifying nests during this time of year. The survey would also include inspecting for nesting migratory birds within up to 100 feet outside of the project area and for other nesting raptors within up to 500 feet outside of the project area. All raptor nests would be considered "active" upon the nest-building stage. If no active nests are observed, no further mitigation is required.

Mitigation Measure BIO-1c (*Avoidance Buffers*): On discovery of any active nests or breeding colonies near work areas, a qualified biologist will determine appropriate avoidance buffer distances based on applicable CDFW and/or USFWS guidelines, the biology of the species, conditions of the nest(s), and the level of project disturbance.

Project-Related Mortality and/or Disturbance of Western Pond Turtle and Western Spadefoot

The project area contains suitable habitat for western pond turtle and western spadefoot. Projects that result in the take of these species would be a violation of state and federal laws and considered a potentially significant impact under CEQA.

Mitigation. Implementation of the following measures would reduce potential impacts to western pond turtle and western spadefoot to a less than significant level under CEQA.

Mitigation Measure BIO-2a (*Pre-construction Survey*): A qualified biologist would complete a preconstruction survey for western pond turtle and western spadefoot within 3 calendar days of the start of construction activities.

Mitigation Measure BIO-2b (*Avoidance*): If any western pond turtles or western spadefoot are observed in the project area, they should be allowed to leave the site of their volition.

Mitigation Measure BIO-2c (*Relocation*): If avoidance is not feasible, a qualified biologist would relocate the animal out of harm's way. The biologist should take into consideration the biology of the species in question when choosing where to relocate the animal to.

Project-Related Impacts to Rare Plant Species

The following rare plant species were identified to potentially occur within or adjacent to the project area: alkali milk-vetch, alkali-sink goldfields, delta button-celery, heartscale, Heckard's pepper-grass, hispid salty bird's-beak, Hoover's spurge, prostrate vernal pool navarretia, San Joaquin spearscale, Sanford's arrowhead, and Wright's trichocoronis. Projects that adversely impact these species or result in the mortality of these species would be considered a significant impact under CEQA and may be a violation of state and/or federal laws.

Mitigation. Implementation of the following measures will reduce potential impacts to rare plants to a less than significant level under CEQA and will ensure compliance with state and federal laws protecting these plant species.

Mitigation Measure BIO-3a (*Rare Plant Surveys*): A qualified botanist/biologist will conduct focused rare plant surveys during the appropriate blooming seasons for alkali milk-vetch, alkali-sink goldfields, delta button-celery, heartscale, Heckard's pepper-grass, hispid salty bird's-beak, Hoover's spurge, prostrate vernal pool navarretia, San Joaquin spearscale, Sanford's arrowhead, and Wright's trichocoronis, according to CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (2018) for areas where ground disturbance will occur and prior to the start of construction.

Mitigation Measure BIO-3b (*Avoidance*): If rare plants are identified, an avoidance buffer and, if necessary, use of exclusion fencing, will be placed around the area so as not to disturb the plants or their root system.

Mitigation Measure BIO-3c (*Relocation Plan*): If rare plant individuals or populations are identified within project work areas, and the plants cannot be avoided, a relocation plan will be prepared and approved by the appropriate agencies.

Project-Related Impacts to Regulated Waters, Wetlands, and Water Quality

Mariposa Slough is potentially considered to be a water of the United States and a water of the State, and runs through the project area. Project-related impacts to these waters would be considered potentially significant under CEQA. Impacts to waters of the United States and State are also subject to the permit requirements of Section 404 and 401 of the Clean Water Act. The placement of fill within any wetlands or other jurisdictional features will require 1) a 404 permit from the USACE, and 2) a 401 Water Quality Certification from the RWQCB, and likely also 3) a Streambed Alteration Agreement from CDFW. Consultation with these agencies would be needed to determine jurisdiction of waters.

Project-Related Impacts to Riparian Habitat

Riparian habitat is present along Mariposa Slough within the riverine and seasonal wetland habitats of the project site. Riparian vegetation is protected by California Fish and Game Code. Temporary impacts to seasonal riparian vegetation (i.e., broadleaf cattail and hardstem bulrush) would not be considered a significant impact because these species would grow back. Permanent impacts to seasonal and year-round (i.e., willow trees) riparian vegetation would be a violation of state law and considered a significant impact under CEQA.

Mitigation. If activities are identified that would impact riparian habitat, implementation of the following measures would reduce potential permanent impacts to riparian habitat to a less than significant level under CEQA and ensure compliance with state laws protecting this resource. If riparian areas are fully avoided, no mitigation is required.

Mitigation Measure BIO-4a (Avoidance): Permanent impacts to riparian habitat will be avoided. Should permanent impacts to riparian habitat be required a CDFW Streamed Alteration Agreement will be obtained.

Less Than Significant Project-Related Impacts

Project-Related Impacts to Special Status Animal Species Absent From, or Unlikely to Occur on, the Project Site

Of the 30 regionally occurring special status animal species, 22 are considered absent from or unlikely to occur within the project area due to past or ongoing disturbance and/or the absence of suitable habitat. These species include: American badger, blunt-nosed leopard lizard, burrowing owl, California tiger salamander, coast horned lizard, conservancy fairy shrimp, Crotch bumble bee, Fresno kangaroo rat, giant gartersnake, green sturgeon, hardhead longhorn fairy shrimp, monarch butterfly, northern leopard frog, Northern California legless lizard, pallid bat, San Joaquin kit fox, steelhead, valley elderberry longhorn shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, western red bat, and yellow rail.

Since it is unlikely that these species would occur onsite, implementation of the project should have no impact on these 22 special status species through construction mortality, disturbance, or loss of habitat. Mitigation measures are not warranted.

Project-Related Impacts to Rare Plant Species Absent From, or Unlikely to Occur on, the Project Site

Of the 21 regionally occurring rare plant species, 10 are considered absent from or unlikely to occur within the project area due to past or ongoing disturbance and/or the absence of suitable habitat. These species include: brittlescale, California alkali grass, Colusa grass, Coulter's goldfields, lesser saltscale, northern slender pondweed, recurved larkspur, spiny-sealed button-celery, subtle orache, and vernal pool smallscale.

Since it is unlikely that these species would occur onsite, implementation of the Project should have no impact on these 10 special status species through construction mortality, disturbance, or loss of habitat. Mitigation measures are not warranted.

Project-Related Impacts to Natural Communities of Special Concern

There are no CNDDDB-designated "natural communities of special concern" recorded within the project area or surrounding lands. Mitigation is not warranted.

Project-Related Impacts to Wildlife Movement Corridors and Native Wildlife Nursery Sites

The project area does contain features that would be likely to function as wildlife movement corridors. The surrounding area consists mostly of agricultural fields, and Mariposa Slough would provide additional cover for wildlife and may serve as a direct route of travel between more suitable habitats. However, wildlife would likely be able to continue to use the Mariposa Slough as a wildlife movement corridor during construction, and full function of the corridor would return after construction is completed. Mitigation is not warranted.

There are no native wildlife nursery sites within the project area. Mitigation is not warranted.

Project-Related Impacts to Critical Habitat

Designated critical habitat is absent from the project area and surrounding lands. Therefore, there would be no impact to critical habitat, and mitigation is not warranted.

Local Policies or Habitat Conservation Plans

The Project appears to be consistent with the goals and policies of the Merced County General Plan. There are no known HCPs or NCCPs in the Project vicinity. Mitigation measures are not warranted.

IV. References

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Appendix A: Representative Photos of the Project Area

TURNER ISLAND WATER DISTRICT
WATER CONSERVATION PROJECT



Photograph 1

Overview of ruderal habitat consisting of a lined canal and farm access road within the project area.



Photograph 2

Overview of riverine habitat present within Mariposa Slough.



Photograph 3

Another overview of riverine habitat within Mariposa Slough.



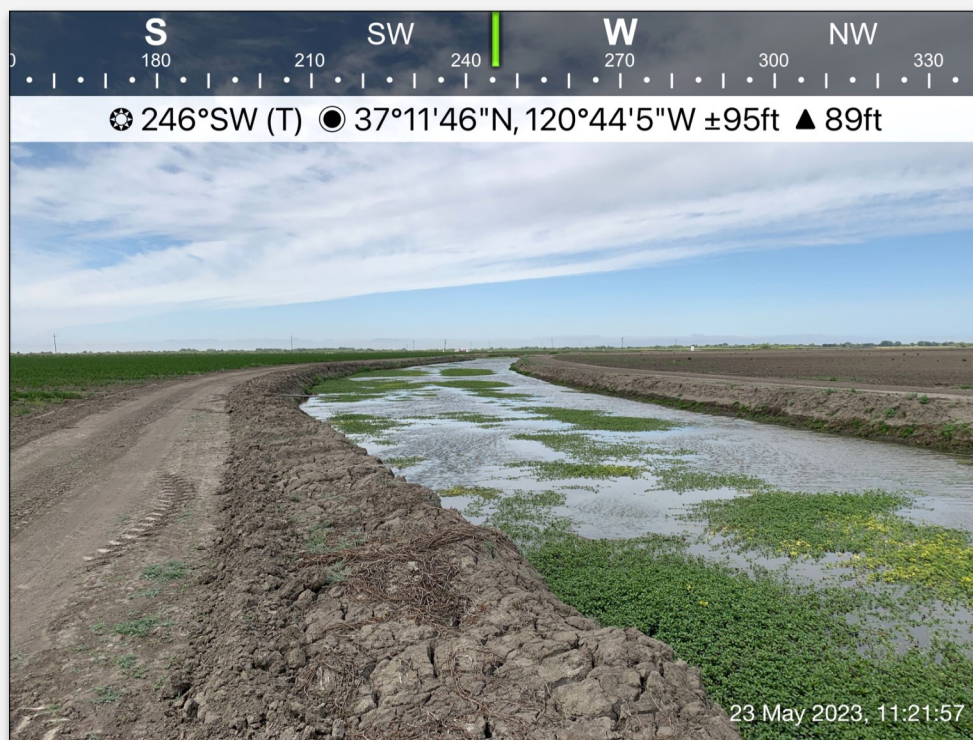
Photograph 4

Overview of the ruderal and agricultural habitat at the location of the proposed basin. The field was planted with tomato.



Photograph 5

Overview of emergent vegetation within the riverine habitat of Mariposa Slough.



Photograph 6

Another overview of riverine habitat within Mariposa Slough. Ruderal habitat can be seen pictured to the left.



Photograph 7

Overview of shallow well site 1, which is comprised as ruderal and agricultural habitat.



Photograph 8

Overview of the ruderal and agricultural habitat located at shallow well site 2.

Appendix B: CNDDB 9- Quad Species List

TURNER ISLAND WATER DISTRICT
WATER CONSERVATION PROJECT



Selected Elements by Common Name

California Department of Fish and Wildlife

California Natural Diversity Database



Query Criteria: Quad (San Luis Ranch (3712027) OR Turner Ranch (3712026) OR Ingomar (3712028) OR Stevinson (3712037) OR Arena (3712036) OR Atwater (3712035) OR Sandy Mush (3712025) OR Santa Rita Bridge (3712015) OR Delta Ranch (3712016) OR Los Banos (3712017) OR Volta (3712018) OR Gustine (3712038))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
alkali milk-vetch <i>Astragalus tener</i> var. <i>tener</i>	PDFAB0F8R1	None	None	G2T1	S1	1B.2
alkali-sink goldfields <i>Lasthenia chrysantha</i>	PDAST5L030	None	None	G2	S2	1B.1
American badger <i>Taxidea taxus</i>	AMAJF04010	None	None	G5	S3	SSC
blunt-nosed leopard lizard <i>Gambelia sila</i>	ARACF07010	Endangered	Endangered	G1	S1	FP
brittlescale <i>Atriplex depressa</i>	PDCHE042L0	None	None	G2	S2	1B.2
burrowing owl <i>Athene cunicularia</i>	ABNSB10010	None	None	G4	S3	SSC
cackling (=Aleutian Canada) goose <i>Branta hutchinsii leucopareia</i>	ABNJB05035	Delisted	None	G5T3	S3	WL
California alkali grass <i>Puccinellia simplex</i>	PMPOA53110	None	None	G2	S2	1B.2
California linderiella <i>Linderiella occidentalis</i>	ICBRA06010	None	None	G2G3	S2S3	
California tiger salamander - central California DPS <i>Ambystoma californiense</i> pop. 1	AAAAA01181	Threatened	Threatened	G2G3T3	S3	WL
Cismontane Alkali Marsh <i>Cismontane Alkali Marsh</i>	CTT52310CA	None	None	G1	S1.1	
coast horned lizard <i>Phrynosoma blainvillii</i>	ARACF12100	None	None	G4	S4	SSC
Coastal and Valley Freshwater Marsh <i>Coastal and Valley Freshwater Marsh</i>	CTT52410CA	None	None	G3	S2.1	
Colusa grass <i>Neostapfia colusana</i>	PMPOA4C010	Threatened	Endangered	G1	S1	1B.1
Conservancy fairy shrimp <i>Branchinecta conservatio</i>	ICBRA03010	Endangered	None	G2	S2	
Coulter's goldfields <i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	PDAST5L0A1	None	None	G4T2	S2	1B.1
Crotch bumble bee <i>Bombus crotchii</i>	IIHYM24480	None	Candidate Endangered	G2	S2	
Delta button-celery <i>Eryngium racemosum</i>	PDAP10Z0S0	None	Endangered	G1	S1	1B.1



Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
ferruginous hawk <i>Buteo regalis</i>	ABNKC19120	None	None	G4	S3S4	WL
giant gartersnake <i>Thamnophis gigas</i>	ARADB36150	Threatened	Threatened	G2	S2	
golden eagle <i>Aquila chrysaetos</i>	ABNKC22010	None	None	G5	S3	FP
great blue heron <i>Ardea herodias</i>	ABNGA04010	None	None	G5	S4	
great egret <i>Ardea alba</i>	ABNGA04040	None	None	G5	S4	
green sturgeon - southern DPS <i>Acipenser medirostris pop. 1</i>	AFCAA01031	Threatened	None	G2T1	S1	
hardhead <i>Mylopharodon conocephalus</i>	AFCJB25010	None	None	G3	S3	SSC
heartscale <i>Atriplex cordulata var. cordulata</i>	PDCHE040B0	None	None	G3T2	S2	1B.2
Heckard's pepper-grass <i>Lepidium latipes var. heckardii</i>	PDBRA1M0K1	None	None	G4T1	S1	1B.2
hispid salty bird's-beak <i>Chloropyron molle ssp. hispidum</i>	PDSCR0J0D1	None	None	G2T1	S1	1B.1
hoary bat <i>Lasiurus cinereus</i>	AMACC05032	None	None	G3G4	S4	
Hoover's spurge <i>Euphorbia hooveri</i>	PDEUP0D150	Threatened	None	G1	S1	1B.2
lesser saltscale <i>Atriplex minuscula</i>	PDCHE042M0	None	None	G2	S2	1B.1
loggerhead shrike <i>Lanius ludovicianus</i>	ABPBR01030	None	None	G4	S4	SSC
longhorn fairy shrimp <i>Branchinecta longiantenna</i>	ICBRA03020	Endangered	None	G1	S2	
midvalley fairy shrimp <i>Branchinecta mesoavallensis</i>	ICBRA03150	None	None	G2	S2S3	
Northern California legless lizard <i>Anniella pulchra</i>	ARACC01020	None	None	G3	S2S3	SSC
Northern Claypan Vernal Pool <i>Northern Claypan Vernal Pool</i>	CTT44120CA	None	None	G1	S1.1	
northern harrier <i>Circus hudsonius</i>	ABNKC11011	None	None	G5	S3	SSC
northern leopard frog <i>Lithobates pipiens</i>	AAABH01170	None	None	G5	S2	SSC
northern slender pondweed <i>Stuckenia filiformis ssp. alpina</i>	PMPOT03091	None	None	G5T5	S2S3	2B.2



Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
pallid bat <i>Antrozous pallidus</i>	AMACC10010	None	None	G4	S3	SSC
prostrate vernal pool navarretia <i>Navarretia prostrata</i>	PDPLM0C0Q0	None	None	G2	S2	1B.2
recurved larkspur <i>Delphinium recurvatum</i>	PDRAN0B1J0	None	None	G2?	S2?	1B.2
San Joaquin kit fox <i>Vulpes macrotis mutica</i>	AMAJA03041	Endangered	Threatened	G4T2	S2	
San Joaquin spearscale <i>Extriplex joaquinana</i>	PDCHE041F3	None	None	G2	S2	1B.2
Sanford's arrowhead <i>Sagittaria sanfordii</i>	PMALI040Q0	None	None	G3	S3	1B.2
spiny-sepaled button-celery <i>Eryngium spinosepalum</i>	PDAP10Z0Y0	None	None	G2	S2	1B.2
steelhead - Central Valley DPS <i>Oncorhynchus mykiss irideus pop. 11</i>	AFCHA0209K	Threatened	None	G5T2Q	S2	
subtle orache <i>Atriplex subtilis</i>	PDCHE042T0	None	None	G1	S1	1B.2
Swainson's hawk <i>Buteo swainsoni</i>	ABNKC19070	None	Threatened	G5	S4	
tricolored blackbird <i>Agelaius tricolor</i>	ABPBXB0020	None	Threatened	G1G2	S2	SSC
Valley Sacaton Grassland <i>Valley Sacaton Grassland</i>	CTT42120CA	None	None	G1	S1.1	
Valley Sink Scrub <i>Valley Sink Scrub</i>	CTT36210CA	None	None	G1	S1.1	
vernal pool fairy shrimp <i>Branchinecta lynchi</i>	ICBRA03030	Threatened	None	G3	S3	
vernal pool smallscale <i>Atriplex persistens</i>	PDCHE042P0	None	None	G2	S2	1B.2
vernal pool tadpole shrimp <i>Lepidurus packardii</i>	ICBRA10010	Endangered	None	G4	S3	
western pond turtle <i>Emys marmorata</i>	ARAAD02030	None	None	G3G4	S3	SSC
western red bat <i>Lasiurus frantzii</i>	AMACC05080	None	None	G4	S3	SSC
western ridged mussel <i>Gonidea angulata</i>	IMBIV19010	None	None	G3	S2	
western spadefoot <i>Spea hammondi</i>	AAABF02020	None	None	G2G3	S3S4	SSC
Wright's trichocoronis <i>Trichocoronis wrightii var. wrightii</i>	PDAST9F031	None	None	G4T3	S1	2B.1



Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
yellow rail <i>Coturnicops noveboracensis</i>	ABNME01010	None	None	G4	S1S2	SSC
Yuma myotis <i>Myotis yumanensis</i>	AMACC01020	None	None	G5	S4	

Record Count: 62

Appendix C: IPaC Species List

TURNER ISLAND WATER DISTRICT
WATER CONSERVATION PROJECT



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish And Wildlife Office

Federal Building

2800 Cottage Way, Room W-2605

Sacramento, CA 95825-1846

Phone: (916) 414-6600 Fax: (916) 414-6713



In Reply Refer To:

Project Code: 2023-0079358

Project Name: Water Conservation Project

May 08, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2))

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <https://www.fws.gov/birds/policies-and-regulations.php>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office

Federal Building

2800 Cottage Way, Room W-2605

Sacramento, CA 95825-1846

(916) 414-6600

PROJECT SUMMARY

Project Code: 2023-0079358
Project Name: Water Conservation Project
Project Type: Water Supply Facility - Maintenance / Modification
Project Description: TIWD has generally been planning a Water Conservation Project (WCP) to conserve lost water which will allow lesser reliance on well water (which helps with groundwater sustainability). P&P believes the WCP will involve some combination of adding automated water control structures to pipe culverts, addition of flow measurement devices, improvements to avoid or reduce losses in the last reach of Sand Slough, and possibly a spill capture reservoir with an additional pump and pipeline return system. The return system may be shorter than the existing one and follow a different alignment to feed reaches of Sand Slough that have enough water demand from them to utilize water from the return system.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@37.186437749999996,-120.71902823093794,14z>



Counties: Merced County, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 12 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Fresno Kangaroo Rat <i>Dipodomys nitratoides exilis</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5150	Endangered
San Joaquin Kit Fox <i>Vulpes macrotis mutica</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered

REPTILES

NAME	STATUS
Blunt-nosed Leopard Lizard <i>Gambelia silus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/625	Endangered
Giant Garter Snake <i>Thamnophis gigas</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

AMPHIBIANS

NAME	STATUS
California Tiger Salamander <i>Ambystoma californiense</i> Population: U.S.A. (Central CA DPS) There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7850	Threatened

CRUSTACEANS

NAME	STATUS
Conservancy Fairy Shrimp <i>Branchinecta conservatio</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

FLOWERING PLANTS

NAME	STATUS
Colusa Grass <i>Neostapfia colusana</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5690	Threatened
Hoover's Spurge <i>Chamaesyce hooveri</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3019	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

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Appendix D: NRCS Web Soil Survey Report

TURNER ISLAND WATER DISTRICT
WATER CONSERVATION PROJECT



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 Merced Area, California



July 22, 2024

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.

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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

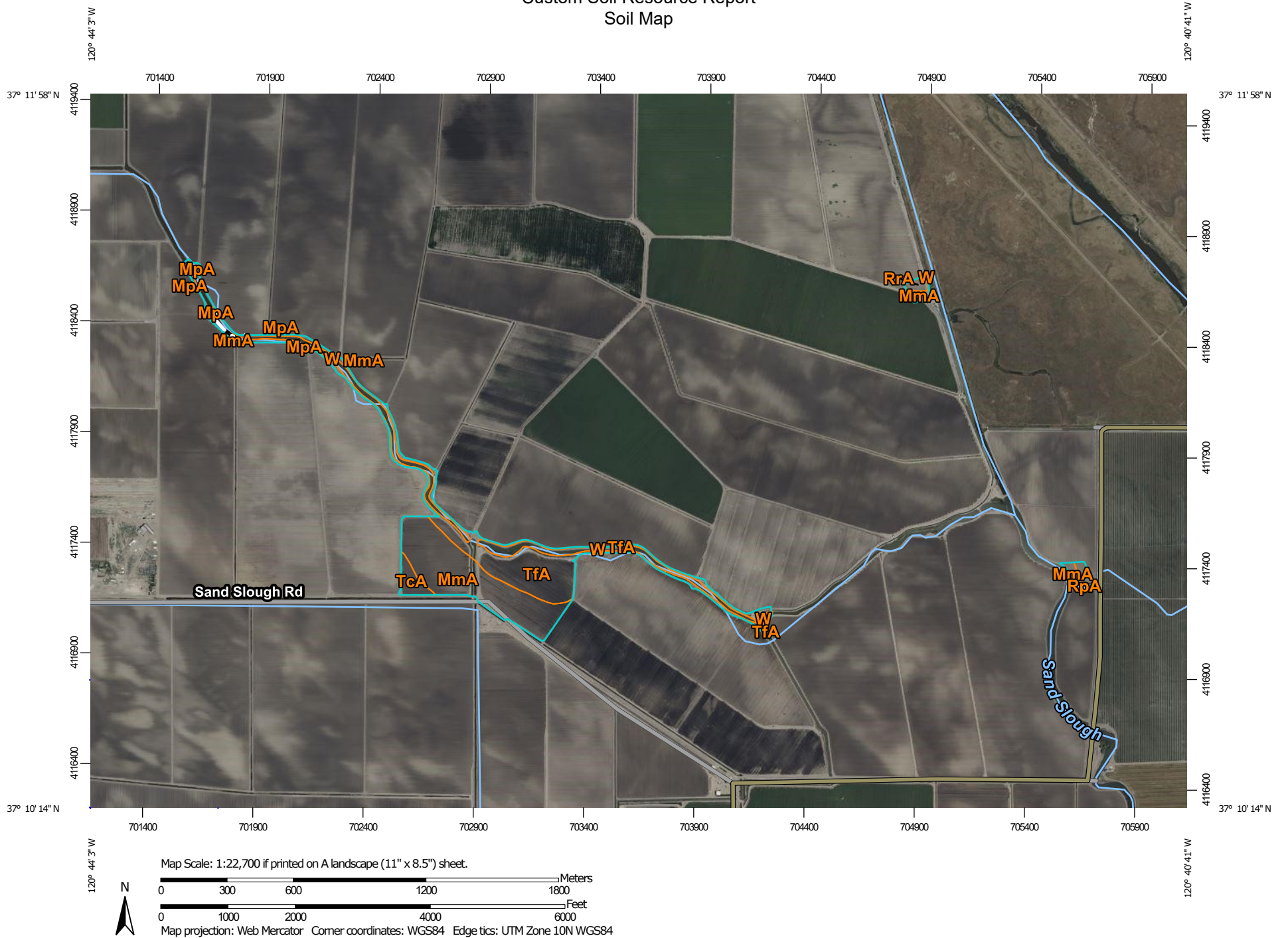
Custom Soil Resource Report

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 1:20,000.

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: Merced Area, California

Survey Area Data: Version 18, Aug 31, 2023

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 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
MmA	Merced clay loam, slightly saline, 0 to 1 percent slopes	39.5	39.9%
MpA	Merced silt loam, overwashed, slightly saline, 0 to 1 percent slopes	3.9	3.9%
RpA	Rossi clay loam, moderately saline-alkali, 0 to 1 percent slope	1.4	1.4%
RrA	Rossi clay loam, strongly saline-alkali, 0 to 1 percent slopes	1.3	1.3%
TcA	Temple clay loam, slightly saline, 0 to 1 percent slopes	3.4	3.5%
TfA	Temple loam, slightly saline, 0 to 1 percent slopes	30.7	31.0%
W	Water	18.8	19.0%
Totals for Area of Interest		99.0	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.

Merced Area, California

MmA—Merced clay loam, slightly saline, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: hjwc
Elevation: 30 to 300 feet
Mean annual precipitation: 9 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 250 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Merced

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 14 inches: clay loam
H2 - 14 to 43 inches: clay
H3 - 43 to 60 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: R017XY901CA - Clayey Basin Group
Hydric soil rating: Yes

Minor Components

Temple

Percent of map unit: 5 percent

Landform: Flood plains

Hydric soil rating: Yes

Piper

Percent of map unit: 5 percent

Hydric soil rating: No

Columbia

Percent of map unit: 5 percent

Landform: Flood plains

Hydric soil rating: Yes

MpA—Merced silt loam, overwashed, slightly saline, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: hjwg

Elevation: 30 to 300 feet

Mean annual precipitation: 9 inches

Mean annual air temperature: 63 degrees F

Frost-free period: 250 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Merced and similar soils: 85 percent

Minor components: 15 percent

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

Description of Merced

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 6 inches: silt loam

H2 - 6 to 20 inches: clay loam

H3 - 20 to 49 inches: clay

H4 - 49 to 60 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

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Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: R017XY901CA - Clayey Basin Group
Hydric soil rating: Yes

Minor Components

Temple

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

Piper

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

Columbia

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

RpA—Rossi clay loam, moderately saline-alkali, 0 to 1 percent slope

Map Unit Setting

National map unit symbol: hjy8
Elevation: 10 to 1,000 feet
Mean annual precipitation: 16 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 200 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Rossi

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 5 inches: clay loam
H2 - 5 to 20 inches: clay
H3 - 20 to 50 inches: sandy clay loam
H4 - 50 to 60 inches: stratified fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: 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: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: D
Ecological site: R017XY901CA - Clayey Basin Group
Hydric soil rating: Yes

Minor Components

Temple

Percent of map unit: 10 percent
Landform: Flood plains
Hydric soil rating: Yes

Merced

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

RrA—Rossi clay loam, strongly saline-alkali, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: hjy9
Elevation: 10 to 1,000 feet
Mean annual precipitation: 16 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 200 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Rossi

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 5 inches: clay loam
H2 - 5 to 20 inches: clay
H3 - 20 to 50 inches: sandy clay loam
H4 - 50 to 60 inches: stratified fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: 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: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Strongly saline (16.0 to 30.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 6w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: D

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Ecological site: R017XY901CA - Clayey Basin Group
Hydric soil rating: Yes

Minor Components

Temple

Percent of map unit: 10 percent
Hydric soil rating: No

Merced

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

TcA—Temple clay loam, slightly saline, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: hjz5
Elevation: 30 to 200 feet
Mean annual precipitation: 10 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 250 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Temple

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 8 inches: clay loam
H2 - 8 to 49 inches: clay loam
H3 - 49 to 60 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly 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: About 0 inches

Custom Soil Resource Report

Frequency of flooding: Occasional

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: C/D

Ecological site: R017XY903CA - Stream Channels and Floodplains

Hydric soil rating: Yes

Minor Components

Columbia

Percent of map unit: 10 percent

Landform: Flood plains

Hydric soil rating: Yes

Merced

Percent of map unit: 5 percent

Hydric soil rating: No

TfA—Temple loam, slightly saline, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: hjz8

Elevation: 30 to 200 feet

Mean annual precipitation: 10 inches

Mean annual air temperature: 63 degrees F

Frost-free period: 250 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Temple and similar soils: 85 percent

Minor components: 15 percent

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

Description of Temple

Setting

Landform: Flood plains

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 8 inches: loam

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H2 - 8 to 49 inches: clay loam

H3 - 49 to 60 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly 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: About 0 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 2w

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: C/D

Ecological site: R017XY903CA - Stream Channels and Floodplains

Hydric soil rating: Yes

Minor Components

Columbia

Percent of map unit: 10 percent

Landform: Flood plains

Hydric soil rating: Yes

Merced

Percent of map unit: 5 percent

Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent

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

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Appendix C: Phase I Survey/Class III Inventory

**PHASE I SURVEY/CLASS III INVENTORY,
TURNER ISLAND WATER DISTRICT SHALLOW
WELL DRILLING AND WATER CONSERVATION
SURVEY PROJECT, MERCED COUNTY, CALIFORNIA**

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MANAGEMENT SUMMARY

An intensive Phase I survey/Class III cultural resources inventory was conducted for the Turner Island Water District (TIWD) Shallow Well Drilling and Water Conservation Survey Project (Project), Merced County, California. The purpose of the Project would reduce land subsidence problems by constructing and operating new wells to reduce TIWD's reliance on the lower aquifer and provide water storage facilities for future water conservation. ASM Affiliates (ASM) conducted this study, with Peter A. Carey, M.A., RPA, serving as principal investigator. The study was undertaken to assist with compliance with the California Environmental Quality Act (CEQA), and Section 106 of the National Historic Preservation Act of 1966, (NHPA) as amended.

The Area of Potential Effects (APE) was defined as the area of potential ground surface disturbance resulting from the installation of the new wells, facilities and pipeline network, including access, work, lay-down, and staging areas. The horizontal APE for the Project totals approximately 182.8-acres (ac). The maximum depth of disturbance for the Project, which is the excavation for the proposed well drilling, is estimated at approximately 200 feet (ft). This disturbance is minimal in overall surface disturbance and is well below the depth that cultural resources could reasonably be encountered. For that reason, the vertical APE for the project is approximately 10 ft., the maximum depth of excavation for improvements at existing weir locations.

A records search of site files and maps was obtained from the Central California Information Center (IC), California State University, Stanislaus. According to the IC, six previous surveys had been completed within the APE, and one previously recorded resource (Siphon Ditch, P-24-001906/CA-MER-467H) was known to exist within it. An additional nine previous surveys had been completed within a half-mile radius of the APE, and eight previously recorded resources, including four prehistoric habitation sites, had been recorded within that same radius.

ASM sent out letters to tribal organizations on the NAHC contact list to determine whether any organization wished to consult under Assembly Bill 52. In addition to the letters, follow-up emails were sent to the list of tribes. ASM received one response from Elizabeth Kipp, chairperson for the Big Sandy Rancheria of Western Mono Indians, stating that they have no comments or concerns about the Project. No additional responses were received from the provided list of tribes.

The Phase I survey/Class III inventory fieldwork was conducted in June 2023 and June 2024, with parallel transects spaced at 15-meter intervals walked along the approximately 182.8-ac APE. One previously identified linear resource — a segment of the mid-twentieth century Siphon Ditch (P-24-001906/CA-MER-467H) — was identified within the APE. The investigated segment of Siphon Ditch has been realigned and upgraded multiple times in the past century and no longer retains integrity of materials, design, feeling, association, and workmanship. Siphon Ditch (P-24-001906/CA-MER-467H) is recommended not eligible for the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR).

A finding of No Effect and No Significant Impact for cultural resources is recommended for the TIWD Shallow Well Drilling and Water Conservation Survey Project.

Though uncovering cultural resources during construction activities is unlikely, given the presence of prehistoric archaeological sites in the vicinity of the APE, ASM recommends:

- All construction personnel take a Cultural Resources Awareness Training (CRAT) given by a qualified archaeologist in order to become familiar with the types of cultural artifacts that exist within the vicinity of the APE and could potentially be uncovered.
- In the unlikely event that cultural resources are identified during construction, it is recommended that all work be stopped within 100 ft. of the discovery and a qualified archaeologist be called out to evaluate the find.

1. INTRODUCTION AND REGULATORY CONTEXT

ASM was retained by Provost and Pritchard Consulting Group to conduct an intensive Phase I survey/Class III cultural resources inventory for the Turner Island Water District Shallow Well Drilling and Water Conservation Project (Project). The proposed Project is in Sections 34, 35, and 36, Township 8 South, Range 11 East (T8S/R11E), Mount Diablo Base and Meridian (MDBM); Section 31 (T8S/R12E, MDBM); Section 1 (T9S/R11E, MDBM); and Sections 5 and 6 (T9S/R12E, MDBM) (Figure 1). The study was undertaken to assist with compliance with the California Environmental Quality Act (CEQA), and Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. The investigation was conducted, specifically, to ensure that significant impacts or adverse effects to historical resources or historic properties do not occur as a result of project construction.

This current study included:

- A background records search and literature review to determine if any known cultural resources were present in the project zone and/or whether the area had been previously and systematically studied by archaeologists;
- An on-foot, intensive inventory of the APE to identify and record previously undiscovered cultural resources and to examine known sites; and
- A preliminary assessment of any such resources found within the subject property.

Peter A. Carey, M.A., RPA, served as principal investigator, and the fieldwork was conducted by ASM Assistant Archaeologists Margarita Lemus, B.A., and Maria Silva, B.A.

This document constitutes a report on the Phase I survey/Class III inventory. Subsequent chapters provide background to the investigation, including historic context studies; the findings of the archival records search; a summary of the field surveying techniques employed; and the results of the fieldwork. We conclude with management recommendations for the Project APE.

1.1 PROJECT LOCATION

The TIWD Shallow Well Drilling and Water Conservation Survey Project is in Merced County, California. The Project area is within an agricultural landscape dominated by agricultural fields and irrigation structures. Numerous paved roads, dirt farm roads, and canals and ditches are located throughout the Project area.

More generally, the Project area is located on the open flats of the San Joaquin Valley. Elevation within the Project area, which is flat, varies between approximately 85 feet (ft.) and 95 ft. above mean sea level (amsl).

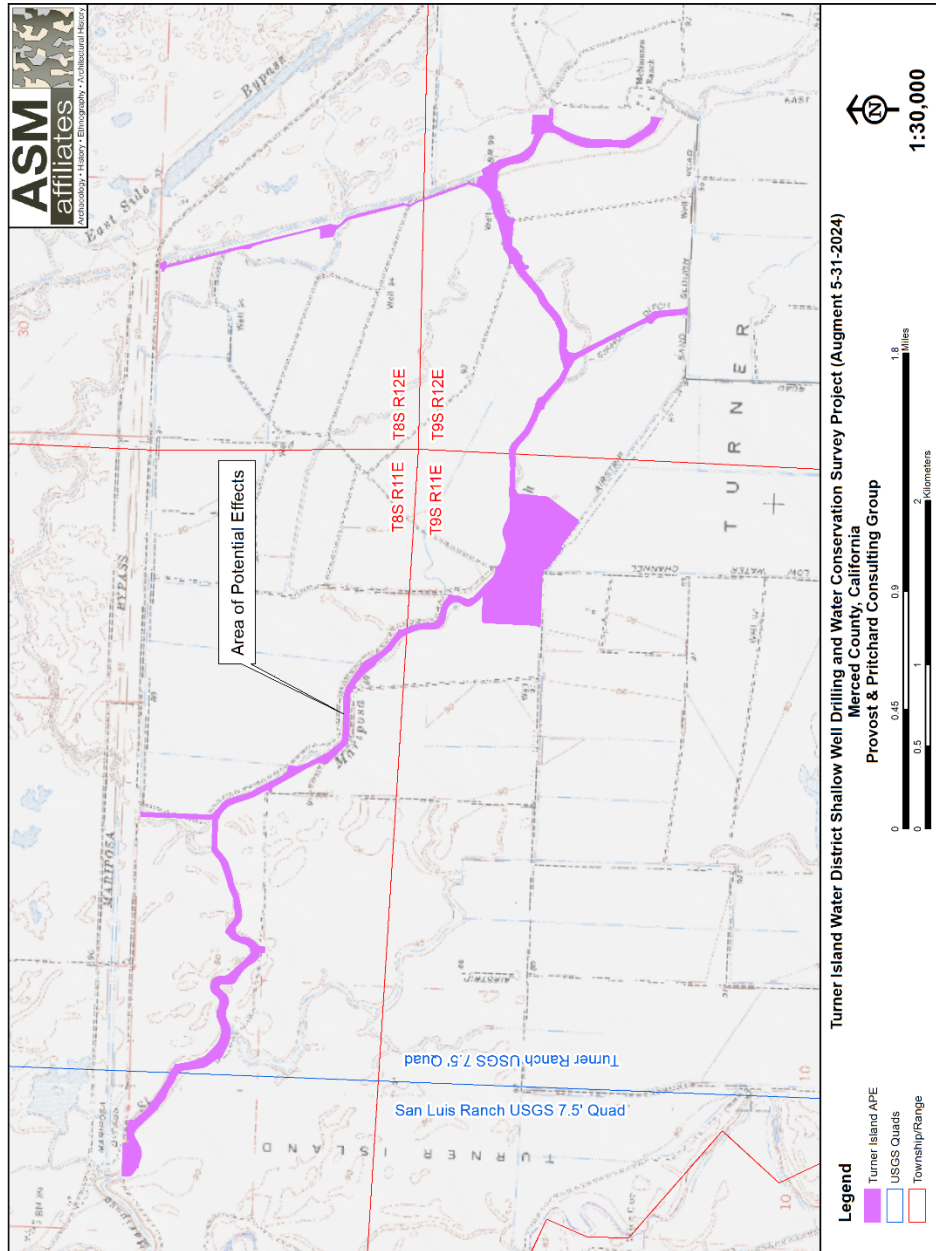


Figure 1. Location of the Turner Island Water District Shallow Well Drilling and Water Conservation Survey Project, Merced County, California.

1.2 PROJECT DESCRIPTION AND APE

TIWD has proposed the Shallow Well Drilling Project to reduce land subsidence problems and the Water Conservation Project (WCP) to reduce loss of water from existing structures. By constructing and operating new wells screened above the Corcoran Clay, TIWD would reduce reliance on the lower aquifer and provide water storage facilities for future water conservation.

The Shallow Well Drilling portion of the Project would involve the construction and operation of two new agricultural irrigation wells screened above the Corcoran Clay so that their use could reduce the District's reliance on the lower aquifer. Well No. 1 would be located roughly at the midway point on the eastern edge of APN 074-030-011. Well No. 2 would be located roughly at the southeastern corner of APN 065-050-004. The new wells would be drilled to a maximum depth of approximately 200 ft. Up to two existing wells that have been drilled and screened below the Corcoran Clay may be abandoned as part of the Project. Transitioning pumping from the deep aquifer below the Corcoran Clay to the shallow aquifer above the Corcoran Clay would mitigate subsidence over the long term. A variance application approved by Merced County would be required to allow the two new wells to be located at a distance closer to the existing deep wells and a surface water way than is normally permitted (300 and 100 ft., respectively).

The Water Conservation portion of the Project would involve the modification of existing canal structures to be equipped with water control gates and flow measurement devices. Existing pumps will be replaced with new pumps which will return water to the head of the District's system and avoid or reduce losses in the last reach of Sand Slough. A proposed reservoir, water control structures and pumps are other components to the Project that would allow the District to store surface water when available and delay the pumping of wells, thereby reducing strain on the groundwater resources from which these wells draw.

The Project APE is defined as the area of potential ground surface disturbance resulting from the installation of the new wells, facilities and pipeline network, including access, work, lay-down, and staging areas. The horizontal APE totals approximately 182.8-ac. The maximum depth of disturbance for the Project, which is the excavation for the proposed well drilling, is not expected to exceed 300 ft. This disturbance is minimal in overall surface disturbance and is well below the depth that cultural resources could reasonably be encountered. For that reason, the vertical APE for the project is approximately 10 ft., the maximum depth of excavation for improvements at existing weirs.

1.3 REGULATORY CONTEXT

1.3.1 California Environmental Quality Act

CEQA is applicable to discretionary actions by state or local lead agencies. Under CEQA, lead agencies must analyze impacts to cultural resources. Significant impacts under CEQA occur when "historically significant" or "unique" cultural resources are adversely affected, which occurs when such resources could be altered or destroyed through project implementation. Historically significant cultural resources are defined by eligibility for or by listing in the CRHR. In practice, the federal NRHP criteria (below) for significance applied under Section 106 are generally

(although not entirely) consistent with CRHR criteria (see PRC § 5024.1, Title 14 CCR, Section 4852 and § 15064.5(a)(3)).

Significant cultural resources are those archaeological resources and historical properties that:

- (A) Are associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- (B) Are associated with the lives of persons important in our past;
- (C) Embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values; or
- (D) Have yielded, or may be likely to yield, information important in prehistory or history.

Unique resources under CEQA, in slight contrast, are those that represent:

An archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- (1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- (2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- (3) Is directly associated with a scientifically recognized important prehistoric or historic event or person (PRC § 21083.2(g)).

Preservation in place is the preferred approach under CEQA to mitigating adverse impacts to significant or unique cultural resources.

1.3.2 National Historic Preservation Act, Section 106

NHPA Section 106 is applicable to federal undertakings, including projects financed or permitted by federal agencies regardless of whether the activities occur on federally managed or privately owned land. Its purpose is to determine whether adverse effects will occur to significant cultural resources, defined as "historical properties" that are listed in or determined eligible for listing in the National Register of Historic Places (NRHP). The criteria for NRHP eligibility are defined at 36 CFR § 60.4 as follows:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that:

- (A) are associated with events that have made a significant contribution to the broad patterns of our history; or
- (B) are associated with the lives of persons significant in our past; or

- (C) embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (D) have yielded or may be likely to yield, information important in prehistory or history.

There are, however, restrictions on the kinds of historical properties that can be NRHP listed. These have been identified by the Advisory Council on Historic Preservation (ACHP), as follows:

Ordinarily cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

- (a) A religious property deriving primary significance from architectural or artistic distinction or historical importance; or
- (b) A building or structure removed from its original location, but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- (c) A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life.
- (d) A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
- (e) A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
- (f) A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
- (g) A property achieving significance within the past 50 years if it is of exceptional importance. (ACHP n.d.)

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2. ENVIRONMENTAL AND CULTURAL BACKGROUND

2.1 ENVIRONMENTAL BACKGROUND AND GEOARCHAEOLOGICAL SENSITIVITY

As noted above, the Project area is on the open flats of the San Joaquin Valley between approximately 110 ft. and 170 ft. amsl. The Project is 11 miles (mi.) southwest of the city of Merced and 9 mi. northeast of the city of Los Banos.

Prior to the appearance of agriculture, starting in the nineteenth century, this area would have been prairie grasslands and riparian environments along creeks and sloughs (Preston 1981). The Project area and immediate surroundings have been farmed and grazed for many years and no native vegetation is present. Perennial bunchgrasses such as purple needlegrass and nodding needlegrass most likely would have been the dominant plant cover in the vicinity prior to cultivation.

A Caltrans District 10 geoarchaeological study that includes the Project area provides a guide for the likelihood of subsurface archaeological deposits within the Project APE (Rosenthal and Meyer 2004). The study aimed to determine the age and depositional history of major landforms in District 10 by combining a synthesis of published paleontological, soils, and archaeological chronometric dates with geoarchaeological field testing. The ages of surface landforms were then mapped to provide an assessment for the potential for buried archaeological deposits. These ages were derived primarily from the Soil Survey Geographic Database (SSURGO) and the State Soils Geographic (STATSGO) database. A map was created from this information that ranked locations in seven ordinal classes for sensitivity for buried archaeological deposits, from Very Low to Very High. This map can be employed to provide a general measure of the potential for buried archaeological deposits in any given location.

The Project area is in Merced County to the east of the San Joaquin River between the Merced River on the north and Chowchilla River on the south. The small portion of the APE in Madera County is located just south of the Chowchilla River. Numerous sloughs and drainages cross the Project APE, most notably Sand Slough. According to the Rosenthal and Meyer (2004) model, the potential for buried archaeological deposits in the Project APE is primarily classified as Moderate for Early to Middle Holocene (7000–4000 years before present [YBP]) in the central and eastern portions, while the potential in the western portion, closer to the San Joaquin River, is classified as High for containing Middle to Late Holocene (4000–2000 YBP) archaeological deposits.

While the model developed by Rosenthal and Meyer (2004) classifies the vicinity of the APE as having Moderate to High potential for subsurface archaeological deposits, there are several considerations not taken into account by the large scale geoarchaeological study which are pertinent to evaluating the potential for buried sites in the APE. The first consideration is that of the work proposed for the Project, which will primarily take place along existing sloughs and man-made levees. The Rosenthal and Meyer (2004) model correctly classifies existing waterways within the APE as having no, or very low, potential for buried archaeological deposits. The location

of the proposed recharge basins, which are the only project aspects not occurring within or along an existing waterway, are shown as being in an area of Moderate potential for Early to Middle Holocene (7000–4000 YBP) and are addressed by the second consideration.

The second consideration relates to the geomorphologic and hydrographic history of the Project area. The Project is centered on Mariposa and Sand sloughs, which prior to reclamation would have been accentuated by numerous sinuous side channels, creating consistent marsh and swamp-like conditions punctuated by flooding, likely seasonally. These conditions are common in areas at the confluence of drainages with major rivers (e.g., San Joaquin River, Merced River, etc.) in the Central Valley and, combined with periodic flooding, necessitated strategic use of these areas which generally emphasized higher ground, typically consisting of low rises on the otherwise flat valley floor (Whitley 2006) or the foothills surrounding the valley (Wallace 1978). As discussed further in Chapter 3, subchapter 3.1 of this report, the results of the records search show the only previously recorded prehistoric sites in the vicinity of the APE are all located on knolls or small rises. These sites are described as habitation sites, but it is not known if they were temporary or seasonal campsites or larger village sites. There is a dearth of knowledge on Northern Valley Yokut tribal territories and village locations, but what is known indicates that villages located on the east side of the San Joaquin River were primarily located along major tributaries of the San Joaquin River and nearer the foothills of the Sierra Nevada (Kroeber 1925; Wallace 1978) or located on the more arid west side of the San Joaquin River (Wallace 1978). These locations are far removed from the vicinity of the Project APE.

Given the extent of work for the proposed Project, the geomorphologic and hydrographic history of the vicinity, and the distance to known ethnographic villages, much of the APE can be considered to have Low potential for buried archaeological sites. However, archaeological resources are possible, specifically in the location for the proposed recharge basins.

2.2 ETHNOGRAPHIC BACKGROUND

Penutian-speaking Yokuts tribal groups occupied the southern San Joaquin Valley region and much of the nearby Sierra Nevada. Ethnographic information about the Yokuts was collected primarily by Powers (1971, 1976 [originally 1877]), Kroeber (1925), Gayton (1930, 1948), Driver (1937), Latta (1977) and Harrington (n.d.). For a variety of historical reasons, existing research information emphasizes the central Yokuts tribes that occupied both the valley and particularly the foothills of the Sierra. The northernmost tribes suffered from the influx of Euro Americans during the Gold Rush and their populations were in substantial decline by the time ethnographic studies began in the early twentieth century. In contrast, the southernmost tribes were partially removed by the Spanish to missions and eventually absorbed into multi-tribal communities on the Sebastian Indian Reservation (on Tejon Ranch), and later the Tule River Reservation and Santa Rosa Rancheria to the north. The result is a scarcity of ethnographic detail on southern Valley tribes, especially in relation to the rich information collected from the central foothills tribes where native speakers of the Yokuts dialects are still found. Regardless, the general details of indigenous lifeways were similar across the broad expanse of Yokuts territory, particularly in terms of environmentally influenced subsistence and adaptation and with regard to religion and belief, which were similar everywhere.

As discussed briefly above, there is a dearth of knowledge on the location of ethnographic villages for Northern Valley Yokuts. Neither Kroeber (1925) nor Wallace (1978) list any ethnographic villages in the vicinity of the APE. This lack of knowledge can likely be attributed to its proximity to the bay area and the early expansion of the mission system and subsequent removal and deterioration of local tribes and, thus, tribal knowledge available to early ethnographers (Kroeber 1925; Wallace 1978).

The Yokuts settlement pattern was largely consistent, regardless of specific tribe involved. Winter villages were typically located along lakeshores and major stream courses (as these existed circa 150 YBP), with dispersal phase family camps located at elevated spots on the valley floor and near gathering areas in the foothills.

Most Yokuts groups, again regardless of specific tribal affiliation, were organized as a recognized and distinct tribelet, a circumstance that almost certainly pertained to the tribal groups noted above. Tribelets were land-owning groups organized around a central village and linked by shared territory and descent from a common ancestor. The population of most tribelets ranged from about 150 to 500 peoples (Kroeber 1925).

Each tribelet was headed by a chief who was aided by a variety of assistants, the most important of whom was the *winatum*, a herald or messenger and assistant chief. A shaman also served as religious officer. While shamans did not have any direct political authority, as Gayton (1930) has illustrated, they maintained substantial influence within their tribelet.

Shamanism is a religious system common to many Native American tribes. It involves a direct and personal relationship between the individual and the supernatural world enacted by entering a trance or hallucinatory state (usually based on the ingestion of psychotropic plants, such as jimsonweed or more typically native tobacco). Shamans were considered individuals with an unusual degree of supernatural power, serving as healers or curers, diviners, and controllers of natural phenomena (such as rain or thunder). Shamans also produced the rock art of this region, depicting the visions they experienced in vision quests believed to represent their spirit helpers and events in the supernatural realm (Whitley 1992, 2000).

The centrality of shamanism to the religious and spiritual life of the Yokuts was demonstrated by the role of shamans in the yearly ceremonial round. The ritual round, performed in the same manner each year, started in the spring with the jimsonweed ceremony, followed by rattlesnake dance and (where appropriate) first salmon ceremony. After returning from seed camps, fall rituals began in the late summer with the mourning ceremony, followed by first seed and acorn rites and then bear dance (Gayton 1930:379). In each case, shamans served as ceremonial officials responsible for specific dances involving a display of their supernatural powers (Kroeber 1925).

Subsistence practices varied from tribelet to tribelet based on the environment of residence. Throughout Native California, and Yokuts territory in general, the acorn was a primary dietary component, along with a variety of gathered seeds. Valley tribes augmented this resource with lacustrine and riverine foods, especially fish and wildfowl. As with many Native California tribes, the settlement and subsistence rounds included the winter aggregation into a few large villages, where stored resources (like acorns) served as staples, followed by dispersal into smaller camps,

often occupied by extended families, where seasonally available resources would be gathered and consumed.

Although population estimates vary and population size was greatly affected by the introduction of Euro-American diseases and social disruption, the Yokuts were one of the largest, most successful groups in Native California. Cook (1978) estimates that the Yokuts region contained 27 percent of the aboriginal population in the state at the time of contact; other estimates are even higher. Many Yokuts people continue to reside in the southern San Joaquin Valley today.

2.3 PRE-CONTACT ARCHAEOLOGICAL BACKGROUND

The southern San Joaquin Valley region has received minimal archaeological attention compared to other areas of the state. In part, this is because the majority of California archaeological work has concentrated in the Sacramento Delta, Santa Barbara Channel, and central Mojave Desert areas (see Moratto 1984). Although knowledge of the region's prehistory is limited, enough is known to determine that the archaeological record is broadly similar to south-central California as a whole (see Gifford and Schenk 1926; Hewes 1941; Wedel 1941; Fenenga 1952; Elsasser 1962; Fredrickson and Grossman 1977; Schiffman and Garfinkel 1981). Based on these sources, the general prehistory of the region can be outlined as follows.

Initial occupation of the region occurred at least as early as the *Paleoindian Period*, or prior to about 10,000 YBP. Evidence of early use of the region is indicated by characteristic fluted and stemmed points found around the margin of Tulare Lake, in the foothills of the Sierra, and in the Mojave Desert proper.

Both fluted and stemmed points are particularly common around lake margins, suggesting a terminal Pleistocene/early Holocene lakeshore adaptation similar to that found throughout the far west at the same time; little else is known about these earliest peoples. More than 250 fluted points have been recovered from the Witt Site (CA-KIN-32), located along the western shoreline of ancient Tulare Lake a distance south of the Project area, demonstrating the importance of this early occupation in the San Joaquin Valley specifically (see Fenenga 1993). Additional finds consist of a Clovis-like projectile point discovered in a flash-flood cut-bank near White Oak Lodge in 1953 on Tejon Ranch (Glennan 1987a, 1987b). More recently, a similar fluted point was found near Bakersfield (Zimmerman et al. 1989), and a number are known from the Edwards Air Force Base and Boron area of the western Mojave Desert. Although human occupation of the state is well-established during the Late Pleistocene, relatively little can be inferred about the nature and distribution of this occupation with a few exceptions. First, little evidence exists to support the idea that people at that time were big-game hunters, similar to those found on the Great Plains. Second, the western Mojave Desert evidence suggests small, very mobile populations that left a minimal archaeological signature. The evidence from the ancient Tulare Lake shore, in contrast, suggests much more substantial population and settlements which, instead of relying on big game hunting, were tied to the lacustrine lake edge. Variability in subsistence and settlement patterns is thus apparent in California, in contrast to the Great Plains.

Substantial evidence for human occupation across California, however, first occurs during the middle Holocene, roughly 7500–4000 YBP. This period is known as the *Early Horizon*, or

alternatively as the Early Millingstone along the Santa Barbara Channel. In the south, populations concentrated along the coast with minimal visible use of inland areas. Adaptation emphasized hard seeds and nuts with tool-kits dominated by mullers and grindstones (manos and metates). Additionally, little evidence for Early Horizon occupation exists in most inland portions of the state, partly due to a severe cold and dry paleoclimatic period occurring at this time, although a site deposit dating to this age has been identified along the ancient Buena Vista shoreline in Kern County to the south (Rosenthal et al. 2007). Regardless of specifics, Early Horizon population density was low with a subsistence adaptation more likely tied to plant food gathering than hunting.

Environmental conditions improved dramatically after about 4000 YBP during the *Middle Horizon* (or Intermediate Period). This period is known climatically as the Holocene Maximum (circa 3800 YBP) and was characterized by significantly warmer and wetter conditions than previously experienced. It was marked archaeologically by large population increase and radiation into new environments along coastal and interior south-central California and the Mojave Desert (Whitley 2000). In the Delta region to the north, this same period of favorable environmental conditions was characterized by the appearance of the Windmill culture which exhibited a high degree of ritual elaboration (especially in burial practices) and perhaps even a rudimentary mound-building tradition (Meighan, personal communication, 1985). Along with ritual elaboration, Middle Horizon times experienced increasing subsistence specialization, perhaps correlating with the appearance of acorn processing technology. Penutian-speaking peoples (including the Yokuts) are also posited to have entered the state roughly at the beginning of this period and, perhaps, to have brought this technology with them (cf. Moratto 1984). Likewise, it appears the so-called “Shoshonean Wedge” in southern California, the Takic-speaking groups that include the Gabrielino/Fernandeño, Tataviam and Kitanemuk, may have moved into the region at that time (Sutton 2009) rather than at about 1500 YBP as first suggested by Kroeber (1925).

Evidence for Middle Horizon occupation of interior south-central California is substantial. For example, in northern Los Angeles County along the upper Santa Clara River, to the south of the San Joaquin Valley, the Agua Dulce village complex indicates occupation extending back to the Intermediate Period, when the population of the village may have been 50 or more people (King et al n.d.). Similarly, inhabitation of the Hathaway Ranch region near Lake Piru, and the Newhall Ranch near Valencia, appears to date to the Intermediate Period (W&S Consultants 1994). To the west, little or no evidence exists for pre-Middle Horizon occupation in the upper Sisquoc and Cuyama River drainages; populations first appear there at roughly 3500 YBP (Horne 1981). The Carrizo Plain, the valley immediately west of the San Joaquin, experienced a major population expansion during the Middle Horizon (W & S Consultants 2004; Whitley et al. 2007), and recently collected data indicates the Tehachapi Mountains region was first significantly occupied during the Middle Horizon (W&S Consultants 2006). A parallel can be drawn to the inland Ventura County region where a similar pattern has been identified (Whitley and Beaudry 1991), as well as the western Mojave Desert (Sutton 1988a, 1988b), the southern Sierra Nevada (W&S Consultants 1999), and the Coso Range region (Whitley et al. 1988). In all of these areas a major expansion in settlement, the establishment of large site complexes, and an increase in the range of environments exploited appear to have occurred sometime roughly around 4,000 years ago. Although most efforts to explain this expansion have focused on local circumstances and events, it is increasingly apparent this was a major occurrence throughout southern California, and any explanation must be sought at a larger level of analysis (Whitley 2000). Additionally, evidence from the Carrizo

Plain suggests the origins of the tribelet level of political organization developed during this period (W&S Consultants 2004; Whitley et al. 2007). Whether this same demographic process holds for the southern San Joaquin Valley, including the study area, is yet to be determined.

The beginning of the *Late Horizon* is set variously at 1500 and 800 YBP, with a growing archaeological consensus for the shorter chronology. Increasing evidence suggests the importance of the Middle-Late Horizons transition (AD 800 to 1200) in the understanding of south-central California prehistory. This corresponds to the so-called Medieval Climatic Anomaly, followed by the Little Ice Age, and this general period of climatic instability extended to about A.D. 1860. It included major droughts matched by intermittent “mega-floods,” and resulted in demographic disturbances across much of the west (Jones et al. 1999). It is believed to have resulted in major population decline and abandonments across south-central California, involving as much as 90 percent of the interior populations in some regions, including the Carrizo Plain (Whitley et al. 2007). It is not clear whether site abandonment was accompanied by a true reduction in population or an agglomeration of the same numbers of peoples into fewer but larger villages in more favorable locations. Population along the Santa Barbara coast appears to have spiked at about the same time that it collapsed on the Carrizo Plain (ibid). Along Buena Vista Lake, in Kern County to the south, population appears to have been increasingly concentrated toward the later end of the Medieval Climatic Anomaly (Culleton 2006), and population intensification also appears to have occurred in the well-watered Tehachapi Mountains during this same period (W&S Consultants 2006).

What is then clear is that Middle Period villages and settlements were widely dispersed across the south-central California landscape, including in the Sierras and the Mojave Desert. Many of these sites are found at locations that lack existing or known historical fresh water sources. Late Horizon sites, in contrast, are typically concentrated in areas where fresh water was available during the historical period, if not currently.

One extensively studied site that shows evidence of intensive occupation during the Middle-Late Horizons transition (~1500 – 500 YBP) is the Redtfeldt Mound (CA-KIN-66/H), located south of the Project area, near the north shore of ancient Tulare Lake and Lemoore. There, Siefkin (1999) reported on human burials and a host of artifacts and ecofacts excavated from a modest-sized mound. He found that both Middle Horizon and Middle-Late Horizons transition occupations were more intensive than Late Horizon occupations, which were sporadic and less intensive (Siefkin 1999:110-111).

The Late Horizon can then be understood as a period of recovery from a major demographic collapse. One result is the development of regional archaeological cultures as the precursors to ethnographic Native California, suggesting that ethnographic lifeways recorded by anthropologists extend roughly 800 years into the past.

The position of San Joaquin Valley prehistory relative to patterns seen in surrounding areas is still somewhat unknown. The presence of large lake systems in the valley bottoms appears to have mediated some of the desiccation seen elsewhere. But, as the reconstruction of Soda Lake in the nearby Carrizo Plain demonstrates (see Whitley et al. 2007) environmental perturbations had serious impacts on lake systems too. Identifying certain of the prehistoric demographic trends for

the San Joaquin Valley, and determining how these trends (if present) correlate with those seen elsewhere, is a current important research objective.

2.4 HISTORICAL BACKGROUND

Spanish explorers first visited the San Joaquin Valley in 1772, but its lengthy distance from the missions and presidios along the Pacific Coast delayed permanent settlement for many years, including during the Mexican period of control over the Californian region. In the 1840s, Mexican rancho owners along the Pacific Coast allowed their cattle to wander and graze in the San Joaquin Valley (JRP Historical Consulting 2009). The Mexican government granted the first ranchos in the San Joaquin Valley in the early 1840s. For instance, the nearly 50,000-ac *Rancho Sanjon de Santa Rita*, on the east side of the San Joaquin River to the west and southwest of the Project area, was granted in 1841 by Governor Juan Alvarado to Francisco Maria Soberanes. Though a number of these large ranchos were granted throughout the valley in the early 1840s, it was not until the annexation of California in 1848 that the exploitation of the southern San Joaquin Valley began (Pacific Legacy 2006).

The discovery of gold in northern California in 1848 resulted in a dramatic increase of population, consisting in good part of fortune seekers and gold miners, who began to scour other parts of the state. After 1851, when gold was discovered in the Sierra Nevada Mountains in eastern Kern County, the population of the area grew rapidly. Some new immigrants began ranching in the San Joaquin Valley to supply the miners and mining towns. Ranchers grazed cattle and sheep, and farmers dry-farmed or used limited irrigation to grow grain crops, leading to the creation of small agricultural communities throughout the valley (JRP Historical Consulting 2009).

After the American annexation of California, the southern San Joaquin Valley became significant as a center of food production for this new influx of people in California. The expansive unfenced and principally public foothill spaces were well suited for grazing both sheep and cattle (Boyd 1997). As the Sierra Nevada gold rush presented extensive financial opportunities, ranchers introduced new breeds of livestock, consisting of cattle, sheep, and pig (Boyd 1997).

With the increase of ranching in the southern San Joaquin came the dramatic change in the landscape, as non-native grasses more beneficial for grazing and pasture replaced native flora (Preston 1981). After the passing of the Arkansas Swamp Lands Act in 1850, efforts were made to reclaim small tracts of land in order to create more usable spaces for ranching. Eventually, as farming supplanted ranching as a more profitable enterprise, large tracts of land began to be reclaimed for agricultural use, aided in part by the extension of the railroad in the 1870s (Pacific Legacy 2006).

Following the passage of statewide “No-Fence” laws in 1874, ranching practices began to decline, while farming expanded in the San Joaquin Valley in both large land holdings and smaller, subdivided properties. As the farming population grew, so did the demand for irrigation. Settlers began reclamation of swampland in 1866. With the passage of the Wright Act in 1887, the legislature allowed the creation of bonded irrigation districts as public entities. The Alta Irrigation District (AID) was created in 1888 with bonds in the amount of \$676,000.00. The district

purchased the 76 Land and Water Company canal system for \$410,000.00 (Grunsky 1898:24) and was one of the first irrigation districts formed in Tulare County (Preston 1981).

During the period of reclaiming unproductive land in the southern San Joaquin Valley, grants were given to individuals who had both the resources and the finances to undertake the operation alone. One small agricultural settlement, founded by Colonel Thomas Baker in 1861 after procuring one such grant, took advantage of reclaimed swampland along the Kern River. This settlement became the City of Bakersfield in 1869 and quickly became the center of activity in the southern San Joaquin Valley and in the newly formed Kern County. Located on the main stage road through the San Joaquin Valley, the town became a primary market and transportation hub for stock and crops, as well as a popular stopping point for travelers on the Los Angeles and Stockton Road. The Southern Pacific Railroad reached the Bakersfield area in 1873, connecting it with important market towns elsewhere in the state, dramatically impacting both agriculture and oil production (Pacific Legacy 2006).

Three competing partnerships developed during this period which had a great impact on control of water, land reclamation and ultimately agricultural development in the San Joaquin Valley: Livermore and Chester, Haggin and Carr, and Miller and Lux, perhaps the most famous of the enterprises. Livermore and Chester were responsible, among other things, for developing the large Hollister plow (three feet wide by two feet deep), pulled by a 40-mule team, which was used for ditch digging. Haggin and Carr were largely responsible for reclaiming the beds of Buena Vista and Kern lakes, and for creating the Calloway Canal, which drained through the Rosedale area in Bakersfield to Goose Lake (Morgan 1914). Miller and Lux ultimately became one of the biggest private property holders in the country, controlling the rights to more than 22,000 square miles. Among the many landholdings of Miller and Lux was the entirety of *Rancho Sanjon de Santa Rita*, which Henry Miller purchased in 1866. The headquarters of Miller and Lux were located on the rancho near present-day Santa Rita Park (Hoover et al. 2002).

Miller and Lux also played a major role in the water development of the state. They recognized early on that control of water would have important economic implications. They controlled, for example, over 100 miles of the San Joaquin River with the San Joaquin and Kings River Canal and Irrigation System. They were also embroiled for many years in litigation against Haggin and Carr over control of the water rights to the Kern River. Descendants of Henry Miller continue to play a major role in California water rights, with his great grandson, George Nickel, Jr., the first to develop the concept of water banking, thus creating a system to buy and sell water (Levine 2011).

The San Joaquin Valley was dominated by agricultural pursuits until the oil boom of the early 1900s, which saw a shift in the region, as some reclaimed lands previously used for farming were leased to oil companies. Nonetheless, the shift of the San Joaquin Valley toward oil production did not halt the continued growth of agriculture (Pacific Legacy 2006). The Great Depression of the 1930s brought with it the arrival of a great number of migrants from the drought-affected Dust Bowl region, looking for agricultural labor. These migrants established temporary camps in the valley, staying on long past the end of the drought and the Great Depression, eventually settling in towns such as Bakersfield where their descendants live today (Boyd 1997).

2.5 RESEARCH DESIGN

2.5.1 Pre-Contact Archaeology

Previous research and the nature of the pre-contact archaeological record suggest two significant NRHP themes, both of which fall under the general Pre-Contact Archaeology area of significance. These are the Expansion of Pre-Contact Populations and Their Adaptation to New Environments, and Adaptation to Changing Environmental Conditions.

The Expansion of Pre-Contact Populations and Their Adaptation to New Environments theme primarily concerns the Middle Horizon/Holocene Maximum. Its period of significance runs from about 4000–1500 YBP. It involves a period during which the prehistoric population appears to have expanded into a variety of new regions, developing new adaptive strategies in the process.

The Adaptation to Changing Environmental Conditions theme is partly related to the Holocene Maximum, but especially to the Medieval Climatic Anomaly. The period of significance for this theme, accordingly, extends from about 4000–800 YBP. This theme involves the apparent collapse of many inland populations, presumably with population movements to better environments such as the coast. It is not yet known whether the southern San Joaquin Valley, with its system of lakes, sloughs and swamps, experienced population decline or, more likely, population increase due to the relatively favorable conditions of this region during this period of environmental stress.

The range of site types that are present in this region include:

- Villages, primarily located on or near permanent water sources, occupied by large groups during the winter aggregation season;
- Seasonal camps, again typically located at water sources, occupied during other parts of the year tied to locally and seasonally available food sources;
- Special activity areas, especially plant processing locations containing bedrock mortars (BRMs), commonly (though not exclusively) near existing oak woodlands, and invariably at bedrock outcrops or exposed boulders;
- Stone quarries and tool workshops, occurring in two general contexts: at or below naturally occurring chert exposures on the eastern front of the Temblor Range; and at quartzite cobble exposures, often on hills or ridges;
- Ritual sites, most commonly pictographs (rock art) found at rockshelters or large exposed boulders, and cemeteries, both commonly associated with villages; and
- A variety of small lithic scatters (low-density surface scatters of stone tools).

The first requisites in any research design are the definition of site age/chronology and site function. The ability to determine either of these basic kinds of information may vary between survey and test excavation projects, and due to the nature of the sites themselves. BRM sites without associated artifacts, for example, may not be datable beyond the assumption that they post-date the Early Horizon and are thus less than roughly 4,000 years old.

A second fundamental issue involves the place of site in the settlement system, especially with respect to water sources. Because the locations of the water sources have sometimes changed over

time, villages and camps are not exclusively associated with existing (or known historical) water sources (W&S Consultants 2006). The size and locations of the region's lakes, sloughs and delta channels, to cite the most obvious example, changed significantly during the past 12,000 years due to major paleoclimatic shifts. This altered the area's hydrology and thus prehistoric settlement patterns. The western shoreline of Tulare Lake, for example, was relatively stable, because it abutted the Kettleman Hills. But the northern, southern and eastern shorelines comprised the near-flat valley floor. Relatively minor fluctuations up or down in the lake level resulted in very significant changes in the areal expression of the lake on these three sides, and therefore the locations of villages and camps. Although perhaps not as systematic, similar changes occurred with respect to stream channels and sloughs, and potential site locations associated with them. This circumstance has implications for predicting site locations and archaeological sensitivity. Site sensitivity is then hardest to predict on the open valley floor, where changes in stream courses and lake levels occurred on numerous occasions.

Nonetheless, the position of southern San Joaquin Valley prehistory relative to the changing settlement and demographic patterns seen in surrounding areas is still somewhat unknown (cf. Siefkin 1999), including to the two NRHP themes identified above. The presence of large lake systems in the valley bottoms can be expected to have mediated some of the effects of desiccation seen elsewhere. But, as the reconstruction of Soda Lake in the nearby Carrizo Plain demonstrates (see Whitley et al. 2007), environmental perturbations had serious impacts on lake systems too. Identifying certain of the prehistoric demographic trends for the southern San Joaquin Valley, and determining how these trends (if present) correlate with those seen elsewhere, is another primary regional research objective.

Archaeological sites would primarily be evaluated for NRHP eligibility under Criterion D, research potential.

2.5.2 Historical Archaeology: Native American

Less research has been conducted on the regional historical archaeological record, both Native American and Euro American. For Native American historical sites, the ethnographic and ethnohistoric periods in the southern San Joaquin Valley extended from first Euro-American contact, in AD 1772, to circa 1900, when tribal populations were first consolidated on reservations. The major significant historic NRHP themes during this period of significance involve the related topics of Historic-Aboriginal Archaeology, and Native American Ethnic Heritage. More specifically, these concern the Adaptation of the Indigenous Population to Euro-American Encroachment and Settlement, and their Acculturation to Western Society. These processes included the impact of missionization on the San Joaquin Valley (circa 1800 to about 1845); the introduction of the horse and the development of a San Joaquin Valley "horse culture," including raiding onto the coast and Los Angeles Basin (after about 1810); the use of the region as a refuge for mission neophyte escapees (after 1820); responses to epidemics from introduced diseases (especially in the 1830s); armed resistance to Euro-American encroachment (in the 1840s and early 1850s); the origins of the reservation system and the development of new tribal organizations and ethnic identities; and, ultimately, the adoption of the Euro-American society's economic system and subsistence practices, and acculturation into that society.

Site types that have been identified in the region dating to the ethnographic/ethnohistoric period of significance primarily include villages and habitations, some of which contain cemeteries and rock art (including pictographs and cupules). Dispersed farmsteads, dating specifically from the reservation period or post-1853, would also be expected. The different social processes associated with this historical theme may be manifest in the material cultural record in terms of changing settlement patterns and village organization (from traditional nucleated villages to single-family dispersed farmsteads); the breakdown of traditional trading networks with their replacement by new economic relationships; changing subsistence practices, especially the introduction of agriculture initially via escaped mission neophytes; the use of Euro-American artifacts and materials rather than traditional tools and materials; and, possibly, changing mortuary practices.

Inasmuch as culture change is a primary intellectual interest in archaeology, ethnographic villages and habitations may be NRHP eligible under Criterion D, research potential. Rock art sites, especially pictographs, may be eligible under Criterion C as examples of artistic mastery. They may also be eligible under Criterion A, association with events contributing to broad patterns of history. Ethnographic sites, further, may be NRHP eligible as Traditional Cultural Properties due to potential continued connections to tribal descendants and their resulting importance in traditional practices and beliefs, including their significance for historical memory, tribal- and self-identity formation, and tribal education.

For Criteria A, C and D, eligibility requires site integrity (including the ability to convey historical association for Criterion A). These may include intact archaeological deposits for Criterion D, as well as setting and feel for Criteria A and C. Historical properties may lack physical integrity, as normally understood in heritage management, but still retain their significance to Native American tribes as Traditional Cultural Properties if they retain their tribal associations and uses.

2.5.3 Historical Archaeology: Euro American

Approaches to historical Euro-American archaeological research relevant to the region have been summarized by Caltrans (1999, 2000, 2007, 2008). These concern the general topics of historical landscapes, agriculture and farming, irrigation (water conveyance systems), and mining. Caltrans has also identified an evaluation matrix aiding determinations of eligibility. The identified research issues include site structure and land-use (lay-out, land use, feature function); economics (self-sufficiency, consumer behavior, wealth indicators); technology and science (innovations, methods); ethnicity and cultural diversity (religion, race); household composition and lifeways (gender, children); and labor relations. Principles useful for determining the research potential of an individual site or feature are conceptualized in terms of the mnemonic AIMS-R, as follows:

1. *Association* refers to the ability to link an assemblage of artifacts, ecofacts, and other cultural remains with an individual household, an ethnic or socioeconomic group, or a specific activity or property use.
2. *Integrity* addresses the physical condition of the deposit, referring to the intact nature of the archaeological remains. In order for a feature to be most useful, it should be in much the same state as when it was deposited. However, even disturbed deposits can yield important information (e.g., a tightly dated deposit with an unequivocal association).

3. *Materials* refers to the number and variety of artifacts present. Large assemblages provide more secure interpretations as there are more datable items to determine when the deposit was made, and the collection will be more representative of the household, or activity. Likewise, the interpretive potential of a deposit is generally increased with the diversity of its contents, although the lack of diversity in certain assemblages also may signal important behavioral or consumer patterns.

4. *Stratigraphy* refers to the vertically or horizontally discrete depositional units that are distinguishable. Remains from an archaeological feature with a complex stratigraphic sequence representative of several events over time can have the added advantage of providing an independent chronological check on artifact diagnosis and the interpretation of the sequence of environmental or sociocultural events.

5. *Rarity* refers to remains linked to household types or activities that are uncommon. Because they are scarce, they may have importance even in cases where they otherwise fail to meet other thresholds of importance (Caltrans 2007:209).

For agricultural sites, Caltrans (2007) has identified six themes to guide research: Site Structure and Land Use Pattern; Economic Strategies; Ethnicity and Cultural Adaptation; Agricultural Technology and Science; Household Composition and Lifeways; and Labor History. Expected site types would include farm and ranch homesteads and facilities, line camps, and refuse dumps. In general terms, historical Euro-American archaeological sites would be evaluated for NRHP eligibility under Criterion D, research potential. However, they also potentially could be eligible under Criteria A and B for their associate values with major historical trends or individuals. Historical landscapes might also be considered.

Historical structures, which are most likely to be pertinent to the current study area, are typically evaluated for NRHP eligibility under Criteria A and/or B, for their associate values with major historical trends or individuals, and C for potential design or engineering importance. Water conveyance systems comprise a particular sub-set of historical structures that are common in the region.

3. ARCHIVAL RECORDS SEARCH AND TRIBAL OUTREACH

3.1 ARCHIVAL RECORDS SEARCH

To determine whether the APE had been previously surveyed for cultural resources, and/or whether any such resources were known to exist on any of them, a records search of site files and maps was conducted by the Central California Information Center (CCIC), California State University, Stanislaus on July 19, 2021. The records search was completed to determine: (i) if prehistoric or historical archaeological sites had previously been recorded within the study areas; (ii) if the project area had been systematically surveyed by archaeologists prior to the initiation of this field study; and/or (iii) whether the region of the field project was known to contain archaeological sites and to thereby be archaeologically sensitive. Records examined included archaeological site files and maps, the NRHP, Historic Property Data File, California Inventory of Historic Resources, and the California Points of Historic Interest.

According to the CCIC, six previous surveys had been completed within the APE (Table 1), and one previously recorded resource was known to exist within it (Table 2). An additional nine previous surveys had been completed within a half-mile radius of the APE (Table 3), and eight previously recorded resources had been recorded within that same radius (Table 4).

Table 1. Previous Surveys within the APE

Report #	Year	Author(s)/Organization	Title
ME-07324	2010	Baloian, R./Applied Earthworks, Inc.	Cultural Resources Survey and Site Evaluation for the Eastside Conveyance Canal Project, Merced County, California.
ME-07467	2011	Baloian, R./Applied Earthworks, Inc.	Cultural Resources Survey and Site Evaluation for the Eastside Conveyance Canal Project, Merced County, California.
ME-07470	2011	Barnes, A.J./USDI Bureau of Reclamation, Mid-Pacific Region	Reclamation: Managing Water in the West, Supplemental Project Description, Context, Statement, Eligibility Determinations, and Findings for the Proposed Eastside Canal Conveyance Project, Merced County, California.
ME-07722	2012	Sikes, N.E. & T. Rodman/Parus Consulting	An Archaeological Survey for the Department of Water Resources' Geotechnical Levee Investigations of the Eastside Bypass, Merced County, California.
ME-08198	2015	Lloyd, J. & K. Asselin/Applied Earthworks, Inc.	Cultural Resources Inventory for the East Side Siphon Inlet Project, Merced County, California.
ME-08662	2019	Schneider, T.D., S. Lane & J. Holson/Pacific Legacy, Inc.	Confidential: Cultural Resources Survey and Inventory for the San Joaquin River Restoration Program Reach 4B1, Eastside Bypass Reach 2, and Eastside Bypass Reach 3, Merced County, California.

Table 2. Resources within the APE

Primary #	Type	Description
P-24-001906	Structure, Site	Historic Siphon Ditch

Table 3. Previous Surveys within 0.5-mi of the APE

Report #	Year	Author(s)/Organization	Title
ME-00611	1985	Haversat, T. and G. S. Breschini/ Archaeological Consulting	Cultural Resources Overview and Management Plan-San Luis, Merced, and Kesterson National Wildlife Refuges in Merced County, California.
ME-00677	1976	Pope, J.L./Consultant for US Fish and Wildlife Service	The Archaeology of the San Luis Island National Wildlife Refuge, Merced County, California.
ME-00678	1983	Pope, J.L./Consultant for US Fish and Wildlife Service	San Luis Island National Wildlife Refuge Bank and Road Stabilization and Fence Improvement Project: Archaeological Survey and Results.
ME-02384	1994	Valentine, N./ US Fish and Wildlife Service	Cultural Resources Investigation, Grasslands Wildlife Management Area, Private Lands Project 1994, Greenhouse Property.
ME-02710	1995	Valentine, N./ US Fish and Wildlife Service	Cultural Resource Report for the Grasslands Partners for Wildlife Project; Greenhouse Ranch Property; Merced County, California.
ME-02712	1997	Valentine, N./ US Fish and Wildlife Service	Cultural Resource Report for the Grasslands Partners for Wildlife Project, Gianelli Property, Merced County, California.
ME-03160	1997	Shapiro, W./Pacific Legacy, Inc.	An Archaeological Assessment Within Portions of the Lower San Joaquin Levee District and the Madera County Flood Control and Water Conservation Levees, Merced and Madera Counties, California; Part of the Cultural Resources Inventory and Evaluation for US Army Corps of Engineers, Sacramento District, PL 84-99 Levee Rehabilitation on the Feather, Bear, Sacramento and San Joaquin Rivers System COE Water Basin System Designations SJ 17, 18, 19, 21, 22, 23 and 24, DACW05-97-P-0465.
ME-03164	1997	Shapiro, L.A. & W. Shapiro/Pacific Legacy, Inc.	Addendum Report: An Archaeological Assessment Within Portions of the Lower San Joaquin Levee District, Fresno, Merced, and Madera Counties, California, Part of the Cultural Resources Inventory and Evaluation for U.S. Army Corps of Engineers.
ME-04813	2002	Elliott, M.T. & T.L. Jackson/Pacific Legacy, Inc.	Cultural Resources Inventory for the Monument 3D Seismic Project, Merced County, California.

Table 4. Resources within 0.5 mi of the APE

Primary #	Type	Description
P-24-000140	Site	Prehistoric habitation; Historic homestead
P-24-000141	Site	Prehistoric habitation
P-24-000191	Site	Prehistoric habitation with cemetery
P-24-000580	Structure	Historic East Side Canal
P-24-001758	Site	Prehistoric habitation
P-24-001908	Structure	Historic Wolfson Farms Airstrip
P-24-001941	Structure	Historic Mariposa Canal
P-24-001962	Structure	Historic East Side Levees

Historical USGS topographical quadrangles and aerial photographs, extending back to 1918 and 1946, respectively, were examined to identify historical use or development of the Project APE.

The Turner Ranch, CA 1918 (HTMC, 1918 ed.) 1:31,680 quadrangle shows modern-day Sand Slough Road as a linear earthwork—possibly a levee—and Mariposa Slough is already charted by that time with no other significant development in the immediate area. By the mid-twentieth century, Sand Slough Road appears as a dirt road, Siphon Ditch appears in its historic alignment, and portions of Mariposa Slough appear channelized as seen in the Turner Ranch, CA 1948 (HTMC, 1948 ed.) 1:24,000 quadrangle. By the 1960s, the existing airstrip located south of the Project APE and the Mariposa Bypass conveyance structure to the north are both established as seen in the Turner Ranch, CA 1961 (HTMC, 1962 ed.) 1:24,000 quadrangle. A series of dirt roads surrounding and bisecting the APE also appear by this time. Historic aerial photography from 1998 suggests that Siphon Ditch was realigned to its current course by that time. No residential or commercial structures appear within the APE.

The results of the archival records search provide additional insight into the archaeological sensitivity of the vicinity of the APE as well as the APE itself. Four prehistoric sites (P-24-000140, P-24-000141, P-24-000191, and P-24-001758) are known to exist within a half-mile radius of the APE. These four sites are described as habitation sites. Unsurprisingly, all four sites are located on small rises or knolls on the otherwise flat valley floor. One chronological marker, a complete projectile point listed as a McGillivray Expanding Stem, was identified at site P-24-000141. This point type is generally attributed to the Pacheco A Complex (Middle Period: ~3600–1700 YBP). This date is in line with those identified in the Rosenthal and Meyer (2004) geoarchaeological assessment for the area, which suggests soils have High potential for Middle to Late Holocene sites (4,000–2,000 YBP). As discussed in Chapter 2, subchapter 2.1 of this report, much of the APE is centered around channelized sloughs and man-made levees in areas with High potential for Middle to Late Holocene sites. There is little potential for buried archaeological sites to be encountered in those portions of the APE.

The proposed recharge basins are in an area described as having Moderate potential for Early to Middle Holocene sites (7,000–4,000 YBP). Review of topographic quadrangles, historic aerial imagery, and Google Earth imagery does not show any small rises or knolls in the area of the proposed recharge basins. In fact, a former slough runs through the location for the proposed recharge basins. While it is possible that buried Early to Middle Holocene archaeological sites could be present in the area, even with the decades of agricultural disturbance, it is unlikely given the lack of identifiable landforms suitable for habitation and the considerably smaller population during that time (Rosenthal and Meyer 2004).

3.2 TRIBAL OUTREACH

ASM sent out letters and emails to tribal organizations on the NAHC contact list to determine whether any organization wished to consult under AB 52. One response was received from Elizabeth Kipp, chairperson for the Big Sandy Rancheria of Western Mono Indians, stating that they have no comments or concerns about the Project. No additional responses were received from

the provided list of tribes. Tribal outreach attempts between ASM and the list of tribes provided in the Sacred Lands Files are presented in Confidential Appendix A.

4. METHODS AND RESULTS

4.1 FIELD METHODS

An intensive Phase I survey/Class III inventory of the TIWD Shallow Well Drilling and Water Conservation Survey Project APE was conducted in June 2023 and June 2024, by ASM Archaeologists Margarita Lemus, B.A., and Maria Silva, B.A. The field methods employed included intensive pedestrian examination of the ground surface for evidence of archaeological sites in the form of artifacts, surface features (such as bedrock mortars, historical mining equipment), and archaeological indicators (e.g., organically enriched midden soil, burnt animal bone); the identification and location of any discovered sites, should they be present; tabulation and recording of surface diagnostic artifacts; site sketch mapping; preliminary evaluation of site integrity; and site recording, following the California Office of Historic Preservation Instructions for Recording Historic Resources, using DPR 523 forms.

Parallel survey transects spaced at 15 m apart were employed for the inventory. The entirety of the approximately 182.8-ac Project APE was intensively surveyed.

4.2 SURVEY RESULTS

As discussed above, the Project APE is on open flat land in an agricultural and farming landscape. The vicinity of the APE consists of agricultural fields and a network of paved and dirt farm roads, canals, and agricultural infrastructure (Figures 2–Figure 5). In general, the APE has been heavily disturbed by past agricultural activities, road grading, and water conveyance infrastructure upgrades. Ground visibility was generally excellent throughout the APE, though some areas were overgrown (see Figure 5). These areas were investigated purposively, with attention paid to dirt roadways, rodent burrows, and barren spots. Overall, ground visibility was adequate for the Phase I survey/Class III inventory.

During the Phase I survey/Class III inventory, ASM identified and updated a short segment of the previously recorded Siphon Ditch (P-24-001906/CA-MER-467H), a mid-twentieth century irrigation ditch. A DPR Site Form update for the investigated segment of Siphon Ditch is provided in Confidential Appendix B. A description of the resource is provided below.

No additional cultural resources of any kind were identified within the Project APE.



Figure 2. Overview of eastern portion of the Project APE, looking southeast.



Figure 3. Overview of eastern portion of the Project APE, looking south.



Figure 4. Overview of western portion of the Project APE, looking north.



Figure 5. Overview of northwestern portion of the Project APE, looking northwest.



Figure 6. Overview of well 1, looking northwest.



Figure 7. Overview of well 2, looking south.

4.2.1 Previously Identified Resources

Siphon Ditch (P-24-001906/CA-MER-467H)

The resource is a short segment of the mid-twentieth century Siphon Ditch irrigation structure. The recorded segment measures approximately 2,520 ft. (northwest-southeast) in length and is situated at an elevation of roughly 90 ft. amsl.

During the current investigation, ASM investigated only that portion of the linear resource within the area of potential effects in unsectioned Turner Island within the Turner Ranch 7.5' quadrangle (T9S/R12E). The ditch was originally recorded by Applied Earthworks, Inc. in 2010. (Baloian 2010) and is as last described. The ditch is earthen in construction and lined with riprap for erosion control in certain places. Contemporary irrigation features (i.e., standpipes, pumps, concrete case culverts, sluice gates) are found along the ditch. No artifacts or related cultural materials of any kind were observed on or immediately adjacent to the canal.

Applied Earthworks, Inc. estimated, based on historical aerial imagery and topographic quadrangles, that Siphon Ditch was constructed sometime between 1940–1961 (Baloian 2010). Investigation of the Turner Ranch, CA 1948 (HTMC, 1948 ed.) 1:24,000 quadrangle, shows that by then the Siphon Ditch was charted in its historic alignment. The segment of Siphon Ditch within the APE is still in its historic alignment on the Turner Ranch, CA 1990 (HTMC, 1990 ed.) 1:24,000 quadrangle; however, historic aerial photography from 1998 shows that Siphon Ditch was charted in its current alignment by that time.

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5 SUMMARY AND RECOMMENDATIONS

An intensive Phase I survey/Class III cultural resources inventory was conducted for the TIWD Shallow Well Drilling and Water Conservation Survey Project, Merced County, California. A records search was conducted at the Central California Information Center, California State University, Stanislaus. The results indicated that six previous surveys had been completed within the APE, and one previously recorded resource (Siphon Ditch) was known to exist within it. An additional nine previous surveys had been completed within a half-mile radius of the APE, and eight previously recorded resources had been recorded within that same radius.

The Phase I survey/Class III inventory fieldwork was conducted in June 2023, with parallel transects spaced at 15-m intervals walked along the approximately 182.8-ac APE. A segment of the previously recorded Siphon Ditch (P-24-001906/CA-MER-467H) was updated as part of the inventory.

5.1 RECOMMENDATIONS

5.1.1 Siphon Ditch (P-24-001906/CA-MER-467H)

The segment of Siphon Ditch within the APE was constructed in the mid-twentieth century and realigned in the 1990s. In 2010, Applied Earthworks, Inc. evaluated Siphon Ditch (P-24-001906/CA-MER-467H) for eligibility to the NRHP/CRHR and found the resource not eligible (NRHP Status Code 6Z) for inclusion under any criteria. ASM concurs with these findings.

5.1.2 Project Recommendations

The Phase I survey/Class III inventory did not identify any cultural resources within the APE, and a Finding of No Effect and No Significant Impact for cultural resources is recommended for the TIWD Shallow Well Drilling and Water Conservation Survey Project.

Though uncovering cultural resources during construction activities is unlikely, given the presence of prehistoric archaeological sites in the vicinity of the APE, ASM recommends:

- All construction personnel take a Cultural Resources Awareness Training (CRAT) given by a qualified archaeologist in order to become familiar with the types of cultural artifacts that exist within the vicinity of the APE and could potentially be uncovered.
- In the unlikely event that cultural resources are identified during construction, it is recommended that all work be stopped within 100 ft. of the discovery and a qualified archaeologist be called out to evaluate the find.

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CONFIDENTIAL APPENDICES

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