DEL PUERTO CANYON RESERVOIR

FINAL

Environmental Impact Report
Volume I

SCH# 2019060254

October 2020

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Del Puerto Canyon Reservoir

Final Environmental Impact Report
Volume I
SCH# 2019060254

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October 2020

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Table of Contents

Volume I

List of Figures

List of Tables

Volume II

List of Appendices

Volume III

Acronyms and Abbreviations

AB	Assembly Bill
ACE	Areas of Conservation Emphasis
AF	Acre-feet
AFY	Acre-feet per year
APE	Area of Potential Effect
ASCE	American Society of Civil Engineers
ATCM	Airborne Toxic Control Measure
BA	Biological Assessment
BACT	Best Available Control Technology
BGEPA	Bald and Golden Eagle Protection Act
BMPs	Best Management Practices
BPS	Best Performance Standards
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAL FIRE	California Department of Forestry and Fire Protection
CalARP	California Accidental Release Program
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CalOSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CCAA	California Clean Air Act
CCID	Central California Irrigation District
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDOC	California Department of Conservation
CDPH	California Department of Public Health
CEC	California Energy Commission
CEHC	California Essential Habitat Connectivity
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act

CESA	California Endangered Species Act
CFCs	Chlorofluorocarbons
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geological Survey
CH_4	methane
CHRIS/CCIC	California Historical Resources Information System-Central California Information Center
CHSC	California Health and Safety Code
CMU	concrete masonry unit
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
CO	Carbon monoxide
COA	Coordinated Operation Agreement
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CSC	California Species of Special Concern
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
CY	cubic yards
CZMA	Coastal Zone Management Act
DAC	Disadvantaged Community
dB	Decibel
dBA	A-weighted decibel
DMC	Delta-Mendota Canal
DOE	Department of Energy
DOGGR	Division of Oil, Gas and Geothermal Resources
DPCR	Del Puerto Canyon Reservoir
DPM	Diesel particulate matter
DPWD	Del Puerto Water District

DSOD	Division of Safety of Dams
DTSC	(California) Department of Toxic Substances Control
DWP	(California) Drinking Water Program
DWR	Department of Water Resources
EFH	Essential Fish Habitat
EHV	extra high voltage
EIR	Environmental Impact Report
EMFAC	Emissions factors (model)
EO	Executive Order
EPA	(United States) Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
Exchange Contractors	San Joaquin River Exchange Contractors Water Authority
FERC	Federal Energy Regulatory Commission
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FMMP	Farmland Mapping and Monitoring Program
FPPA	Farmland Protection Policy Act
ft	feet
FWCA	Fish and Wildlife Coordination Act
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
GGS	Giant garter snake
GHG	Greenhouse Gas
GIS	geographic information system
gpm	Gallons per minute
GRCD	Grasslands Resource Conservation District
GWP	Global warming potential
H_2O	Water
H_2S	Hydrogen sulfide
HCFCs	hydrochlorofluorocarbons
HCP	Habitat Conservation Plan
HDD	Horizontal Directional Drilling
HFCs	Hydrofluorocarbons

HMBP	Hazardous Materials Business Plan
Hp	horsepower
HUC	hydrologic unit code
H:V	Horizontal to vertical
I-5	Interstate 5
IL4	Incremental Level 4 (water delivery)
IPCC	Intergovernmental Panel on Climate Change
kV	kilovolt
kVA	Kilovolt-amperes
kW	kilowatt
kWh	kilowatt hours
LCFS	Low Carbon Fuel Standard
LEV	Low Emissions Vehicles
LF	Linear Feet
LOS	Level of Service
LSAA	Lake and Streambed Alteration Agreement
LUST	leaking underground storage tank
MBTA	Migratory Bird Treaty Act
MEI	Maximally Exposed Individual
mg	Milligrams
MG	million gallons
mg/L	milligrams per liter
mgd	million gallons per day
MHI	median household income
MID	Modesto Irrigation District
$MMTCO_2e$	million metric tons CO_2e
MOU	Memorandum of Understanding
MSDS	Material Safety Data Sheet
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation

NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOC	Notice of Completion
NOI	Notice of Intent
NOP	Notice of Preparation
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NRCS	National Natural Resources Conservation Service
NVRRWP	North Valley Regional Recycled Water Program
NWR	National Wildlife Refuge
O_3	Ozone
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
Pb	Lead
PCE	Passenger Car Equivalent
PFCs	Perflourocarbons
PG&E	Pacific Gas & Electric
PM_{10}	Particulate Matter $\leq$ 10 microns
$PM_{2.5}$	Particulate Matter $\leq$ 2.5 microns
ppm	parts per million
PPV	Peak particle velocity
PRC	Public Resources Code
PVC	Polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
ROG	Reactive organic gases
ROW	right-of-way
RPF	Renewables Portfolio Standard
RSL	Regional Screening Levels
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement

SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
SDAC	Severely Disadvantaged Community
SDC	Seismic Design Category
SDWA	Federal Safe Drinking Water Act
SF_6	Sulfur hexafluoride
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan (SIP)
SJCOG	San Joaquin Council of Governments
SJV	San Joaquin Valley
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLDMWA	San Luis and Delta-Mendota Water Authority
SLIC	Spills, Leaks, Investigations, and Clean-up
SO_2	sulfur dioxide
SO_x	sulfur oxides
SOD	South of Delta
SR	State Route
SRA	State Responsibility Area
SRJECWA	San Joaquin River Exchange Contractors Water Authority
SSC	Species of Special Concern
STLC	soluble threshold limit concentration
SVP	Society of Vertebrate Paleontology
SWAP	State Wildlife Action Plan
SWAMP	Surface Water Ambient Monitoring Program
SWP	State Water Project
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TAF	thousand acre-feet
TBM	tunnel boring machine
TCLP	toxicity characteristic leaching procedure
TDS	total dissolved solids
TID	Turlock Irrigation District

TIMS	Transportation Injury Mapping System
TMDL	Total Maximum Daily Load
TMP	Traffic Management Plan
U.S.C.	United States Code
UBC	Uniform Building Code
URBEMIS model	Urban Emissions (URBEMIS) model
USACE	US Army Corps of Engineers
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
UV	Ultraviolet light
VERA	Voluntary Emissions Reduction Agreement
VMT	Vehicle miles traveled
VOC	Volatile organic compounds
WDR	Waste Discharge Requirements
WSID	West Stanislaus Irrigation District
ZEV	Zero Emissions Vehicles

ES. Executive Summary

This Environmental Impact Report (EIR) assesses the potential environmental impacts of the Del Puerto Canyon Reservoir Project (DPCR or proposed project). The Project Partners for the DPCR are Del Puerto Water District (DPWD) and the San Joaquin River Exchange Contractors Water Authority (Exchange Contractors). DPWD is acting as the California Environmental Quality Act (CEQA) lead agency representing the Project Partners. Inquiries regarding this document and project should be directed to:

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ES.1 Project Overview

The proposed DPCR involves the construction and operation of a reservoir on Del Puerto Creek to provide approximately 82,000 acre-feet (AF) of new off-stream storage to the Central Valley Project (CVP). Project components are the reservoir (including the main dam, three saddle dams and other facilities), conveyance facilities to transport water to/from the Delta-Mendota Canal (DMC) (including a pipeline and pumping plant), electrical facilities, relocation of Del Puerto Canyon Road, and relocation of existing and proposed utilities that are within the project area.

ES.1.1 Project Objectives

The proposed project would increase water storage capacity in California's Central Valley. While the Project Partners are both entitled to water from the CVP, their actual allocations may be severely curtailed in dry years. For example, in 2014 and 2015, DPWD received no CVP water at all, and it is expected that restrictions in CVP operations will result in DPWD receiving no more than an average of 45 percent of its contract allocation on an annual basis under non-drought conditions. The Exchange Contractors have a contractual water allotment of 840,000 AF, but in critical years the allocation is reduced to 75 percent, or 650,000 AF. Additionally, lack of storage for CVP supplies means that the Project Partners are not always able to use CVP water when it is available to them, and some water may be effectively lost. Reliable local water storage would allow the Project Partners to better manage water by taking delivery of CVP supplies when available and during wet periods and store it for later irrigation use.

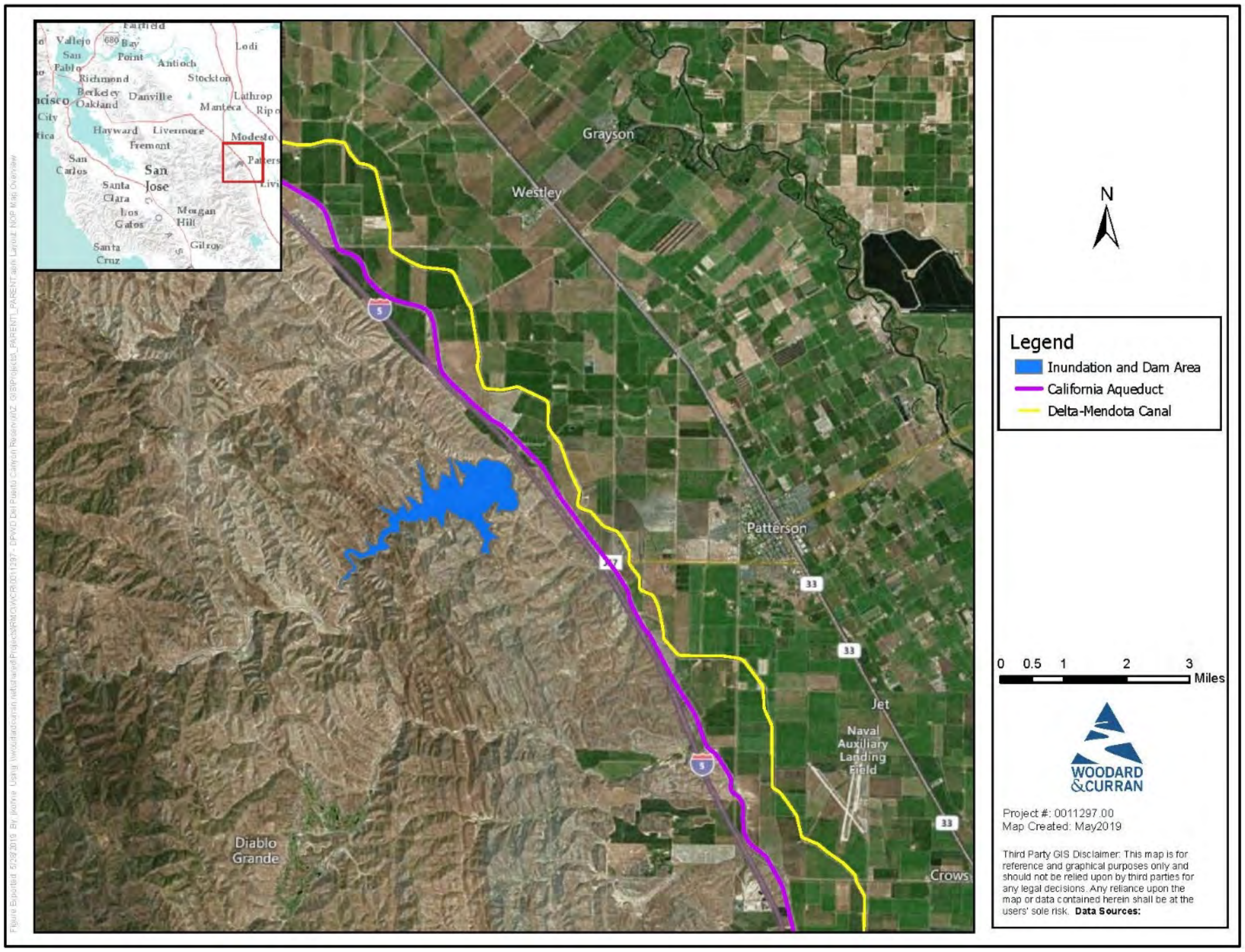
The proposed project objectives are:

- Increase South of Delta water storage capacity in California's Central Valley by 80,000 AF;
- Provide local water storage in proximity to the DMC and to users;
- Improve water supply reliability;
- Increase peak irrigation season water supplies;
- Improve the ability to manage regional surface water and groundwater resources;
- Improve regional self-reliance and economic benefit from agricultural production, jobs, and industry multipliers;
- Develop a cost-effective project that provides water at an affordable cost to landowners; and
- Avoid displacement of homes and businesses.

ES.1.2 Project Location

The proposed project is located in Stanislaus County, as shown in **Figure ES-1**. Proposed project facilities consist of a reservoir, main dam, and three saddle dams plus the facilities needed to convey water between the DMC and the reservoir. The project also includes relocating existing and proposed utilities that run north-south through the project area and a section of Del Puerto Canyon Road, which runs east-west through the project area. The reservoir would be located in the foothills west of the City of Patterson, California and Interstate-5. The proposed project would provide storage for existing water allocations from the USBR, with whom the Project Partners are contracted. Water would be stored in the reservoir when supply is available from the DMC and delivered to farms within service areas of DPWD and the Exchange Contractors in San Joaquin, Stanislaus, Merced, Fresno and Madera Counties.

Figure ES-1: Project Location



ES.1.3 Proposed Project

The proposed project would consist of a reservoir and dam constructed to provide approximately 82,000 AF of new off-stream storage in the Central Valley. Water would be pumped from the DMC to the reservoir through new conveyance infrastructure. Existing and proposed utilities that pass through the project area would be relocated to avoid the inundation and dam area, as would a portion of the existing Del Puerto Canyon Road. The proposed project components consist of:

- Reservoir, including main dam and three (3) saddle dams, a spillway, and inlet/outlet works to/from the reservoir;
- Conveyance facilities, including a diversion/outfall facility on the DMC, a pumping plant, pipeline and energy dissipation facilities at the DMC outfall, along with related appurtenant components;

- Electrical facilities including power supply line and electrical substation to power the pumping plant;
- Relocation of Del Puerto Canyon Road, which currently runs east-west through the project area; and
- Relocation of a portion of existing and proposed utilities, including high-voltage powerlines and a petroleum pipeline that currently run north-south through the project area.

ES.1.4 Proposed Schedule

Construction of the proposed project is expected to take approximately six years. Several factors affect this anticipated schedule, including funding, environmental compliance, contracting methods and strategies, material and construction equipment availability, lead time for fabrication of major pipe, pumping and generating equipment, labor force constraints, and weather. Additional adjustments to the schedule would be addressed as required during project development and implementation.

ES.2 Summary of Alternatives

This EIR evaluates the proposed project, the No Project Alternative, an alternative with a smaller reservoir at the same site, and an alternative site for the reservoir. Identification of the No Project Alternative and the other alternatives addressed in this EIR was informed by the project objectives as presented in *Section 1.2, Proposed Project Objectives*, comments received during the scoping process and an alternatives screening conducted for the project. Alternatives that were considered but rejected from further consideration are discussed in *Chapter 4, Alternatives*. Alternatives considered in this EIR include:

No Project Alternative: this alternative assumes that the proposed project would not be constructed. Without the project it is assumed that the Project Partners would have to pursue additional surface water resources to meet water demands or portions of their service areas would need to be fallowed due to a lack of water supply.

Proposed Project: this alternative assumes construction of an 82,000-AF reservoir in Del Puerto Canyon.

Smaller Reservoir-40 TAF Alternative: this alternative includes construction of a 40,000-AF reservoir in Del Puerto Canyon with the dam and other facilities located at the same locations as described for the proposed project and includes relocation of Del Puerto Canyon Road.

Ingram Canyon Reservoir Site: this alternative includes construction of a dam and 67,000-AF reservoir in Ingram Canyon, which is located about 5 miles north of the Del Puerto Canyon Reservoir site. This alternative would also include construction of conveyance facilities but would not require relocation of a public road.

ES.3 Summary of Impacts

Table ES-1 provides a summary of potential impact by topic area. The table does not include impacts or criteria that were deemed not applicable to activities associated with the DPCR.

Findings presented in the table are indicated using the following abbreviations:

NI: No Impact
LTS: Less than Significant (does not require mitigation)
LSM: Less than Significant with Mitigation
PS: Potentially Significant
SU: Significant and Unavoidable

Table ES-1: DPCR Impact Summary

Impact Statement	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
3.1 Aesthetics			
AES-1: Substantial damage to scenic resources within a state scenic highway and substantial degradation of existing visual character or quality, or a substantial adverse effect on a scenic vista.	SU	**Mitigation Measure AES-1:** Implement Color Palette Consistent with Existing Environment	SU
AES-2: Potential to create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.	PS	**Mitigation Measure AES-2:** Nighttime Construction Lighting **Mitigation Measure AES-3:** Directional Lighting for Dam Control Building, Inlet/Outlet Works Control Building and Bifurcation Structure	LSM
3.2 Agriculture and Forestry Resources			
AG-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), to Non-Agricultural Use.	LTS	No mitigation is required.	LTS
AG-2: Conflict with Existing Zoning for Agricultural Use, or a Williamson Act Contract.	LTS	No mitigation is required.	LTS
3.3 Air Quality			
AIR-1: Conflict with or obstruct implementation of the applicable air quality plan.	LTS	No mitigation is required.	LTS
AIR-2: Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or state ambient air quality standard.	PS	**Mitigation Measure AIR-1:** Reduce NOX Emissions	LSM
AIR-3: Expose sensitive receptors to substantial pollutant concentrations.	PS	**Mitigation Measure AIR-1** above, shall apply.	LSM
AIR-4: Result in other emissions (such as those leading to odors or adversely affecting a substantial number of people).	LTS	No mitigation is required.	LTS
3.4 Biological Resources – Terrestrial			
BIO-TERR-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	PS	**Mitigation Measure BIO-TERR-1a:** Avoid and Minimize Impacts on Biological Resources **Mitigation Measure BIO-TERR-1b:** Avoid and Compensate for Adverse Effects on Special-Status Plant Species ~~Where Temporary Ground-disturbing Activities Would Take Place~~ **Mitigation Measure BIO-TERR-1c:** Compensate for the Loss of Habitat Occupied by Vernal Pool Fairy Shrimp and/or Vernal Pool Tadpole Shrimp **Mitigation Measure BIO-TERR-1d:** Avoid, Minimize, and Compensate for Impacts of Valley Elderberry Longhorn beetle: **Mitigation Measure BIO-TERR-1e:** Avoid and Minimize Impacts on Special-Status Amphibians **Mitigation Measure BIO-TERR-1f:** Compensation for the Loss of California Tiger Salamander Habitat **Mitigation Measure BIO-TERR-g:** Compensate for the Loss of California Red-legged Frog Habitat **Mitigation Measure BIO-TERR-1h:** Compensate for the Loss of Foothill Yellow-legged Frog Habitat **Mitigation Measure BIO-TERR-1i:** Avoid and Minimize Impacts on Special-Status Reptiles **Mitigation Measure BIO-TERR-1j:** Avoid and Minimize Impacts on Western Burrowing Owl **Mitigation Measure BIO-TERR-1k:** Avoid and Minimize Impacts on Nesting Birds	LSM

Impact Statement	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
		Mitigation Measure BIO-TERR-1l: Avoid and Minimize Impacts on Swainson's Hawk **Mitigation Measure BIO-TERR-1m:** Compensate for the Loss of Swainson's Hawk Foraging Habitat **Mitigation Measure BIO-TERR-1n:** Avoid and Minimize Impacts on Bats **Mitigation Measure BIO-TERR-1o:** Avoid and Minimize Impacts on San Joaquin Kit Fox **Mitigation Measure BIO-TERR-1p:** Compensate for the Loss of San Joaquin Kit Dispersal Habitat **Mitigation Measure BIO-TERR-1q:** Avoid and Minimize Impacts on American Badger	
BIO-TERR-2: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	PS	**Mitigation Measure BIO-TERR-2:** Compensate for Effects on Riparian Habitat or Other Sensitive Natural Community	LSM
BIO-TERR-3: Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	PS	**Mitigation Measure BIO-TERR-3:** Compensate for Adverse Effects on State or Federally Protected Wetlands	LSM
BIO-TERR-4: 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.	PS	**Mitigation Measure BIO-TERR-4a:** Implement Wildlife Crossings **Mitigation Measure BIO-TERR-4b:** Wildlife Corridor Preservation and Enhancement **Mitigation Measure BIO-TERR-4c:** Roadway Wildlife Crossing Signage	LSM
BIO-TERR-5: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	PS	**Mitigation Measure BIO-TERR-5:** Develop a Management Plan for the Protection and Enhancement of Oak Woodlands	LSM
BIO-TERR-6: Conflict with Adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.	NI	No mitigation is required.	NI
BIO-TERR-7: Spread invasive plant species such that there would be a substantial effect on special-status species, sensitive communities, or wetlands.	LTS	No mitigation is required.	LTS
3.5 Biological Resources - Fisheries			
BIO-FISH-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	PS	**Mitigation Measure BIO-FISH-1:** Spawning Gravel Monitoring and Mitigation	LSM
BIO-FISH-2: 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.	LTS	No mitigation is required.	LTS
3.6 Cultural Resources			
CULT-1: Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5.	LTS	No mitigation is required.	LTS
CULT-2: Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to §15064.5.	SU	**Mitigation Measure CULT-1:** Treatment Plan for Site P-50-0344 **Mitigation Measure CULT-2:** Implement Measures to Protect Previously Unidentified Cultural Resources	SU
CULT-3: Disturb any human remains, including those interred outside of dedicated cemeteries.	PS	**Mitigation Measure CULT-3:** Implement Measures If Construction Activities Inadvertently Discover or Disturb Human Remains	LSM
3.7 Energy Resources			
ENE-1: Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.	PS	**Mitigation Measure AIR-1**, above, shall apply.	LSM

Impact Statement	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
ENE-2: Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	LTS	No mitigation is required.	LTS
3.8 Geology and Soils			
GEO-1: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault ii) Strong seismic ground shaking iii) Seismic-related ground failure, including liquefaction iv) Landslides.	PS	**Mitigation Measure GEO-1:** Perform Design-Level Geotechnical Evaluations for Seismic Hazards	LSM
GEO-2: Result in substantial soil erosion or the loss of topsoil.	PS	**Mitigation Measure GEO-2:** Prepare and Implement a SWPPP and associated BMPs	LSM
GEO-3: 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.	PS	**Mitigation Measure GEO-1** above, shall apply.	LSM
GEO-4: 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.	PS	**Mitigation Measure GEO-3:** Site-specific Geotechnical Investigation for Soil Expansion	LSM
GEO-5: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	PS	**Mitigation Measure GEO-4:** Preparation and Implementation of a Paleontological Resources Monitoring and Protection Plan	LSM
3.9 Greenhouse Gas Emissions			
GHG-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	SU	**Mitigation Measure GHG-1:** Best Performance Standards	SU
GHG-2: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	SU	**Mitigation Measure GHG-1** above, shall apply.	SU
3.10 Hazards and Hazardous Materials			
HAZ-1: 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.	PS	**Mitigation Measure HAZ-1a:** Hazardous Materials Management and Spill Control Plan **Mitigation Measure HAZ-1b:** Preparation of Hazardous Materials Business Plan **Mitigation Measure HAZ-1c:** Implement Avoidance and Minimization Measures for Impacts Related to the Abandoned Oil Wells **Mitigation Measure HAZ-1d:** Management of Abandoned Oil Wells **Mitigation Measure HAZ-1e:** Soil Sampling and Disposal	LSM
3.11 Hydrology and Water Quality			
HYD-1: Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.	PS	**Mitigation Measure HYD-1a:** Comply with General Order for Dewatering or Other Appropriate NPDES Permit **Mitigation Measure HYD-1b:** Comply with Reclamation Monitoring Plan for Non-Project Water Pump-in	LSM
HYD-2: Decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.	PS	**Mitigation Measure HYD-2:** Develop Operation Requirements to Deliver Recharge Water to Lower Del Puerto Creek	LSM
HYD-3: In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation.	LTS	No mitigation is required.	LTS
HYD-4: Conflict with Coordinated Operation Agreement and existing CVP operations	LTS	No mitigation is required.	LTS

Impact Statement	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
3.12 Land Use and Recreation			
LU-1: Conflict with Any Applicable Land Use Plan, Policy, or Regulation.	PS	**Mitigation Measure LU-1:** Minimize Transmission Structures in Highway Service Commercial Areas **Mitigation Measure BIO-TERR-2**, above, shall apply.	LSM
3.13 Traffic and Transportation			
TR-1: Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.	SU	**Mitigation Measure TR-1:** I-5 Sperry Avenue ~~Road~~ Interchange Improvements Project Contributions	SU
TR-2: Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).	LTS	No mitigation required.	LTS
TR-3: Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	PS	**Mitigation Measure TR-2:** Implementation of Construction Traffic Management Plan	LSM
TR-4: Result in inadequate emergency access.	PS	**Mitigation Measure TR-2**, above, shall apply.	LSM
3.14 Tribal Cultural Resources			
TRIB-1: Project would cause a substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in the California Register of Historical Resources or other local register.	NI	No mitigation is required.	NI
TRIB-2: Project would cause a substantial adverse change in the significance of a tribal cultural resource that is determined by the lead agency to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria, the lead agency shall consider the significance of the resource to a California Native American tribe.	NI	No mitigation is required.	NI
3.15 Utilities and Service Systems			
UTL-1: 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.	SU	All other mitigation measures that apply to the utility relocation portion of the project.	SU

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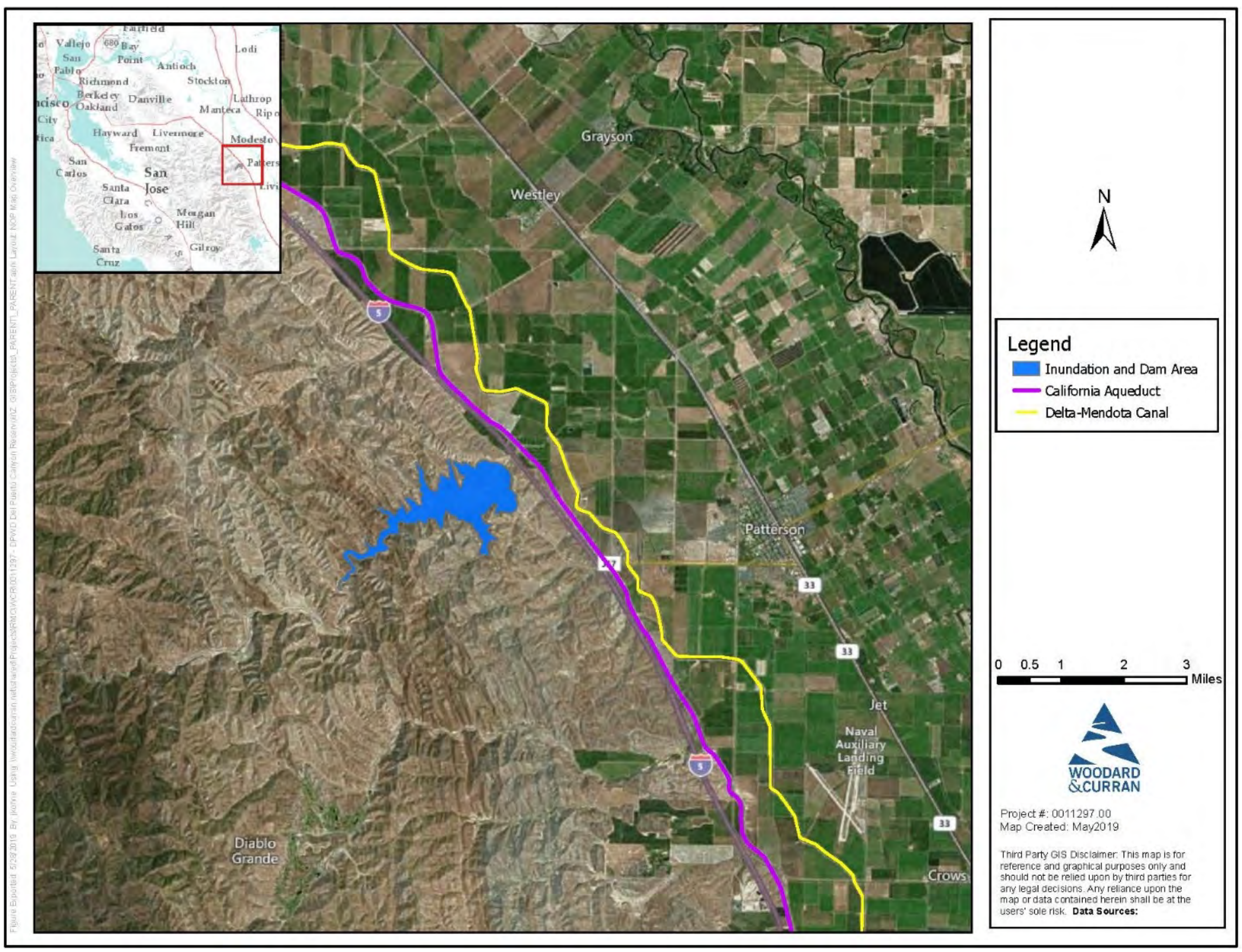
Chapter 1 Introduction

Del Puerto Water District (DPWD), as California Environmental Quality Act (CEQA) lead agency representing the Project Partners for the Del Puerto Canyon Reservoir Project (DPCR or proposed project) has prepared this Draft Environmental Impact Report (Draft EIR). The Project Partners for the DPCR include DPWD and the San Joaquin River Exchange Contractors Water Authority (Exchange Contractors). The Exchange Contractors is a California Joint Powers Authority, consisting of four entities responsible for water delivery and conveyance: Central California Irrigation District, the San Luis Canal Company, Firebaugh Canal Water District, and the Columbia Canal Company.

This EIR has been developed to provide the public and responsible and trustee agencies reviewing the DPCR an analysis of potential effects on the local and regional environment associated with construction and operation of the DPCR. The primary purpose of the DPCR is to develop additional, locally controlled south of Delta water storage for the Project Partners, who depend on the U.S. Bureau of Reclamation's federal Central Valley Project (CVP) for delivery of a major portion of their water supplies. The proposed reservoir would provide 82,000 acre-feet (AF) of new off-stream storage. **Figure 1-1** shows the Project location.

Figure 1-1: Project Location



1.1 Background

1.1.1 Need for Water Storage

Water storage is an important part of water supply reliability because of the extreme seasonal and annual variability of California's water supply. On average, California receives about 200 million acre-feet of water per year in the form of rain and snow. California also has the most variable weather conditions in the nation, often fluctuating between extreme drought and extreme flood. Climate change may intensify that variability. Both DPWD and the Exchange Contractors receive water deliveries from the CVP. DPWD's contract with Reclamation provides for delivery of up to 140,210 acre-feet (AF) of CVP water annually, but due to both hydrologic and regulatory restrictions at certain times on the operations of the CVP, DPWD may receive only a fraction of that allocation. In 2014 and 2015, DPWD received no CVP water at all, and it is expected that restrictions in CVP operations will result in the DPWD receiving no more than an average of 45 percent of its contract allocation on an annual basis under non-drought conditions. The Exchange Contractors have a contractual water allotment of 840,000 AF, but in critical years the allocation is reduced to 75 percent, or 650,000 AF (USBR 1967, USBR 1939). Reliable local water storage would allow the Project Partners to take delivery of water when it is available during wet periods and store it for use when there is demand for irrigation supply. Upon execution of appropriate agreements to ensure cost share and recovery, storage could also be provided for management of supplies for South of Delta refuges.

Thus, to increase water supply reliability during the irrigation season and to ensure deliveries during periods when surface water supplies are limited, DPWD and the Exchange Contractors have an identified need to store water to better serve the needs of their landowners. The existing San Luis Reservoir serves both the State Water Project and CVP, and Reclamation manages the federal share of storage in San Luis Reservoir. DPWD has limited access to storage capacity in San Luis Reservoir associated with its contract with Reclamation primarily during what is called the Rescheduling Period and has a restricted ability to store "non-Project" water (i.e., non-CVP water) or other developed supplies in the reservoir. The Exchange Contractors have no ability to directly utilize San Luis Reservoir for storage.

The Exchange Contractors' primary need is to store water during "non-critical" years under the Exchange Contract for use in "critical" years to increase or stabilize dry year supplies, reduce acreage fallowed and reduce groundwater pumping. During critical years the Exchange Contactors supply was reduced to 75 percent in 1977, 1991, 1992, and 1994, 61 percent in 2014, and 54 percent in 2015. Fallowing records are not readily available for 1977, 1991, 1992, and 1994 but would be within the range of the fallowing that occurred in 2014 – 11,410 acres fallowed and 2015 – 4,472 acres fallowed. Groundwater pumping records within Central California Irrigation District, which comprises about 63 percent of the combined Exchange Contractors service area, show that District critical year groundwater pumping increases 84,000 AF on average over non-critical years. The Exchange Contractors have developed a Water Resources Plan that has identified the need for up to 50,000 AF of storage and has identified potential projects including the DPCR project to meet that need (Exchange Contractors 2019). Due to these conditions and limitations, there is an acknowledged need for additional, locally controlled water storage for the Project Partners.

In their Agricultural Water Management Plan, DPWD has documented that CVP contract allocation shortages are resulting in increased land fallowing, crop damage and crop loss, increased groundwater pumping and higher water costs that create economic hardships for growers (DPWD 2008). Lack of available water has resulted in extensive fallowing in the DPWD service area, where fallowed acreage between 2001 and 2018 ranged from about 5,600 acres in 2002 to a high of over 11,000 acres in 2015 (about 25 percent of the approximately the 45,000 acres of farmland within the District), when DPWD received no CVP allocation (DPWD 2019). As documented in the Reservoir Operations Model (Appendix F), DPWD has a demonstrated need for additional storage, and even assuming that the proposed project would make 20,000 AF of storage available to DPWD, there would still be unmet demand for water, especially in dry and critically dry years.

In addition to the up to 50,000 AF storage need identified by the Exchange Contractors and the 20,000 AF demand for storage identified by DPWD, the Project Partners are working to obtain federal funding and accommodate federal benefits that would be commensurate with the funding. The Bureau of Reclamation would have an opportunity to participate in the project for South of Delta benefits ~~of~~ providing new water supply and up to 20,000 AF ~~of storage, which could be used to store water~~ for wildlife refuges. In addition, up to 11,000 AF of storage could be made available in all water year types. The Project Partners are thus aiming to develop a reservoir that could store at least 80,000 AF (80 TAF) of water.

1.1.2 Water to be Stored in the Proposed Project

Water to fill the proposed Del Puerto Canyon Reservoir would come from the existing contracts that DPWD and the Exchange Contractors have for water supply delivered through the Delta-Mendota Canal (DMC), which would be diverted and pumped from the DMC to the reservoir. Existing USBR water rights would be used for the Project Partners to receive their contracted water supply and store it in the reservoir. However, the reservoir would capture some flows from Del Puerto Creek, and while there would also be releases to the creek downstream of the reservoir, some water would be retained. The Project Partners do not anticipate acquiring water for storage in the proposed Project from sources other than the CVP or Del Puerto Creek at this time. If, and to the extent any non CVP or Del Puerto Creek water supplies were to be acquired for storage in the Project via transfer, such transfers would undergo project-specific environmental review at the appropriate time. The Project Partners have applied to the State Water Resources Control Board Division of Water Rights for the right to store a portion of Del Puerto Creek flows in the reservoir.

1.2 Proposed Project Objectives

The proposed project objectives are:

- Increase South of Delta water storage capacity in California's Central Valley by 80,000 AF;
- Provide local water storage in proximity to the DMC and to users;
- Improve water supply reliability;
- Increase peak irrigation season water supplies;
- Improve the ability to manage regional surface water and groundwater resources;
- Improve regional self-reliance and economic benefit from agricultural production, jobs, and industry multipliers;
- Develop a cost-effective project that provides water at an affordable cost to landowners; and
- Avoid displacement of homes and businesses.

1.3 Compliance with CEQA

Because the proposed project is a discretionary action of the project partners or any agencies involved in its approval, this document has been prepared to satisfy the requirements of CEQA. In addition, the Project Partners intend to pursue federal funding under the Water Infrastructure Improvements for the Nation (WIIN) Act, administered by the U.S. Department of the Interior, Bureau of Reclamation (Reclamation), which would require future NEPA documentation. This document was prepared pursuant to CEQA Public Resources Code, Division 13, Environmental Protection; the CEQA Guidelines; and is also structured to enable future NEPA documentation subject to the Council on Environmental Quality

(CEQ) Regulations for Implementing the National Environmental Policy Act (Parts 1500 to 1508). The purpose of the EIR is to publicly disclose the potential direct, indirect, and cumulative impacts of the proposed project and its alternatives on the environment, including the no project, and to identify feasible mitigation or alternatives capable of reducing or avoiding any of the Project's significant environmental impacts, for the benefit of decision makers, the general public, and responsible and trustee agencies.[1]

1.3.1 CEQA Lead Agency

The Del Puerto Water District is the lead agency under CEQA for the DPCR. DPWD is working with the Exchange Contactors in implementing the DPCR. The Exchange Contractors are a responsible agency under CEQA and would rely on the EIR in determining whether to approve the proposed project.

1.4 Intended Uses of EIR

The Project Partners would use this EIR to evaluate the DPCR, make Findings regarding any identified impacts, and if necessary, to adopt a Statement of Overriding Considerations regarding any significant unavoidable impacts. The information in the EIR would also be used to support the acquisition of regulatory permits or approvals. **Table 1-1** summarizes the potential permits and/or approvals from other agencies that may be required prior to construction of the proposed project.

1.5 Organization of the EIR

This Draft EIR is organized into the following Chapters:

Executive Summary. This chapter includes a summary of the DPCR, and the alternatives evaluated in this EIR. It includes a table that summarizes the impacts, mitigation measures, and levels of significance after mitigation measures are incorporated.

Chapter 1: Introduction. This chapter provides an introduction and overview describing the Project objectives, purpose and scope of the Draft EIR, intended uses of the EIR, including a list of responsible agencies and approvals, brief explanation of areas of controversy and issues to be resolved, and a summary of the CEQA/NEPA review process.

Chapter 2: Description of the Proposed Project. This chapter presents a description of the proposed DPCR, including a description of proposed facilities and construction and operational considerations.

Chapter 3: Environmental Setting, Impacts and Mitigation. This chapter analyzes the environmental impacts of the proposed project. Each topic includes a description of the environmental setting, regulatory setting, methodology, thresholds of significance, impacts (both project-specific and cumulative), mitigation measures, and significance after mitigation. Chapter 3 includes subsections addressing each environmental resource.

Chapter 4: Alternatives. This chapter evaluates the impacts of alternatives as compared to the impacts of the Proposed Project. The impacts of alternatives are summarized so as to allow identification of the environmentally superior alternative.

Chapter 5: Other CEQA Considerations. This chapter identifies any direct or indirect impacts, significant and unavoidable impacts, the Project's irreversible and irretrievable commitment of resources, and growth-inducing impacts.

[1] A responsible agency is an agency other than the lead agency that has a legal responsibility for also carrying out or approving a project; a responsible agency must actively participate in the lead agency's environmental process, review the lead agency's environmental document, and use that document when making a decision on the project. Trustee agencies have jurisdiction over certain resources held in trust for the people of California but do not have a legal authority over approving or carrying out a project.

Chapter 6: Consultation, Coordination and Compliance. This chapter addresses compliance with federal statutes and regulations, summarizes the scoping process, and identifies the distribution of the EIR, and opportunities for future public involvement.

Chapter 7: EIR Preparers. This chapter lists the authors of the EIR.

Table 1-1: Responsible and Trustee Agencies and Coordination

Agency	Type of Approval
FEDERAL	
Reclamation	Addition of turnout location to existing contracts for moving water in and out of DMC
Reclamation	Possible funding through Public Law 114-322, WIIN Act
	License for construction of Diversion / Outfall facility on DMC (1081 encroachment permit, lands action)
Reclamation	Possible Warren Act contract for conveyance and storage of non-project water (may be needed for Del Puerto Creek water); other agreements as needed
U.S. Army Corps of Engineers	Clean Water Act (CWA), Section 404 Permit for fill of wetlands or waters of the US
U.S. Fish and Wildlife Service & National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service	Section 7 Consultation/Biological Opinions
STATE	
State Water Resources Control Board	Water Right for a portion of flows from Del Puerto Creek
California Department of Fish and Wildlife (CDFW)	Streambed Alteration Agreement for construction of reservoir on Del Puerto Creek
CDFW	Incidental Take Permit for California Endangered Species Act (CESA)
CalOSHA	Construction Permit / Tunnel Classification
CA Office of Historic Preservation	Section 106 Consultation
Caltrans	Encroachment Permit for crossing of Interstate 5
~~Central Valley Regional Water Quality Control Board (CVRWQCB)~~ State Water Resources Control Board	CWA, Section 401 Water Quality Certification
CVRWQCB	Notice of Intent for coverage under Statewide Construction Stormwater Permit (Section 402 CWA)
CVRWQCB	Notice of Intent for coverage under Low-Threat Discharge Order for Dewatering during Construction and for Pipeline Discharges for Testing and Startup
Department of Water Resources	Encroachment permit for crossing of California Aqueduct
Department of Water Resources, Division of Safety of Dams	Approval for construction and operation of proposed dam
California Department of Conservation, Division of Oil, Gas, and Geothermal Resources	Permit if project requires work on any existing oil and gas wells in the project area
LOCAL	
Stanislaus County	Approval of relocation of Del Puerto Canyon Road
Stanislaus County	Grading permit, building permit, and tree removal permit

Agency	Type of Approval
Stanislaus County	Williamson Act cancellation (if needed), possible General Plan Amendment
San Joaquin Valley Air Pollution Control District	Possible Voluntary Emissions Reduction Agreement Authority to Construct and Permit to Operate for generator at pumping plant.

1.6 CEQA Process and Review

1.6.1 Notice of Preparation

In accordance with Section 15082 of the CEQA Guidelines, a Notice of Preparation (NOP) was submitted to the State Clearinghouse (State Clearinghouse # 2019060254) and circulated to local, state and federal agencies on June 27, 2019. The NOP was and remains available online on the DPCR website. Postcard notification of the NOP's availability was mailed to 35 organizations and individuals.

1.6.2 Public Scoping

Scoping Meeting

A scoping meeting for the DPCR was held on July 24, 2019 as described below:

Patterson Fire Station #2
1950 Keystone Pacific Parkway
Patterson, CA
4:00 to 6:00 pm

The time and location of the scoping meeting were included in the postcards announcing the availability of the NOP and a public notice of the meeting was placed in The Patterson Irrigator. The scoping meeting was held in an open house format, and comment cards were provided for those attending the meeting to facilitate submittal of written comments. At the scoping meeting, the DPCR was presented to the public through use of graphic displays showing maps and information about Project objectives and impacts to be evaluated in the EIR. Staff from both Project Partners were in attendance to answer questions from the public. The graphic displays used at the meeting were also made available to the public on the DPCR website.

Areas of Controversy and Issues to Be Resolved

Comments received in response to circulation of the NOP are included in Appendix A. Written comments were received from 23 private citizens and from the following state and regional/local agencies:

- Central Valley Regional Water Quality Control Board
- State of California, Native American Heritage Commission
- Department of Water Resources, Division of Safety of Dams
- San Joaquin Valley Air Pollution Control District
- Department of Water Resources
- California Department of Conservation, Division of Oil ,Gas and Geothermal Resources
- Stanislaus County Environmental Review Committee
- Stanislaus County Department of Environmental Resources

A summary of comments and responses to those comments is included in the scoping summary in Appendix A. Comments included questions about the need for the Project, its proposed location, the

Project description, including whether the project would include recreational uses, and about air quality and energy impacts of construction and operation and the potential effects the project would have on wildlife and habitats and on aesthetic, recreational and cultural resources in Del Puerto Canyon. Questions were raised about safety of the dam and the risk of flooding in the event of a dam failure. All of these issues are evaluated in this Draft EIR.

1.6.3 Public Review of the EIR

Draft EIR

This Draft EIR is being made available to local, state and federal agencies and to interested organizations and individuals who may wish to review and provide comment. Notices of Availability have been distributed to agencies, organizations and individuals who have expressed interest in being included on the Project mailing list. Publication of this Draft EIR begins a 45-day public review period, during which comments may be directed to the address below. During the public review period, the Project Partners ~~will hold~~ held a public meeting on the Draft EIR.

Del Puerto Water District
Attn: Anthea Hansen,
General Manager
17840 Ward Avenue/P.O. Box 1596
Patterson, CA 95363

Final EIR

Comments received during the public review period ~~will be~~ are addressed in a Response to Comments document, which together with the Draft EIR, ~~will~~ constitute the Final EIR. As the CEQA Lead Agency, DPWD will consider certifying the EIR as complete under CEQA Guidelines Section 15090. The Exchange Contractors, as a responsible agency, will consider the certified EIR when making their decision about whether to approve the proposed project. Project approvals would require that the Project Partners make written findings with respect to any significant effects relevant to implementation of their portion of the proposed project identified in the EIR.

1.7 References

DPWD. 2008. Agricultural Water Management Plan.

DPWD. 2019. CVP Allocation and Fallowing Acreage 2001-2018.

Exchange Contractors. 2019. Water Resource Management Plan Projects. July 2019.

U.S. Bureau of Reclamation (USBR). 1939. Contract for Purchase of Miller & Lux Water Rights. July 27, 1939

U.S. Bureau of Reclamation (USBR). 1967. Second Amended Contract for Exchange of Waters. December 6, 1967.

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Chapter 2 Description of the Proposed Project

The Project Partners propose to construct a reservoir on Del Puerto Creek in the foothills of the Coast Range Mountains west of Patterson. The proposed reservoir would provide approximately 82,000 AF of new off-stream storage in the Central Valley.

2.1 Project Location

The proposed project is located in Stanislaus County, as shown in **Figure 1-1** in *Chapter 1, Introduction*. Proposed project facilities consist of a reservoir, main dam, and three saddle dams plus the facilities needed to convey water between the DMC and the reservoir. The project also includes relocating existing utilities that run north-south through the project area and a section of Del Puerto Canyon Road, which runs east-west through the project area. The reservoir would be located in the foothills west of the City of Patterson, California and Interstate-5. The proposed project would provide storage for water allocations from the USBR with whom the Project Partners have contracts. Water would be stored in the reservoir when supply is available from the DMC and delivered to farms within service areas of DPWD and the Exchange Contractors in San Joaquin, Stanislaus, Merced, Fresno and Madera Counties. The Project Partners do not anticipate acquiring water for storage from sources other than the CVP or Del Puerto Creek at this time. If, and to the extent any transfer water is acquired for storage, such transfers would undergo appropriate project specific environmental review at that time.

2.2 Proposed Project Components

The proposed project components consist of:

- Reservoir, including main dam and three (3) saddle dams, a spillway, and inlet/outlet works to/from the reservoir;
- Conveyance facilities, including a diversion/outfall facility on the DMC, a pumping plant, pipeline and energy dissipation facilities at the DMC outfall, along with related appurtenant components;
- Electrical facilities including power supply line and electrical substation to power the pumping plant;
- Relocation of a portion of Del Puerto Canyon Road, which currently runs east-west through the project area; and
- Relocation of existing and proposed utilities, including high-voltage pipelines and a petroleum pipeline that currently run north-south through the project area.

2.2.1 Reservoir

The reservoir and dam locations are shown in **Figure 2-1.** The facilities at the main dam, including the spillway are illustrated in **Figure 2-2.** <u>The footprint of the reservoir and dams would be about 825 acres.</u>

Figure 2-1: Reservoir and Dam Locations

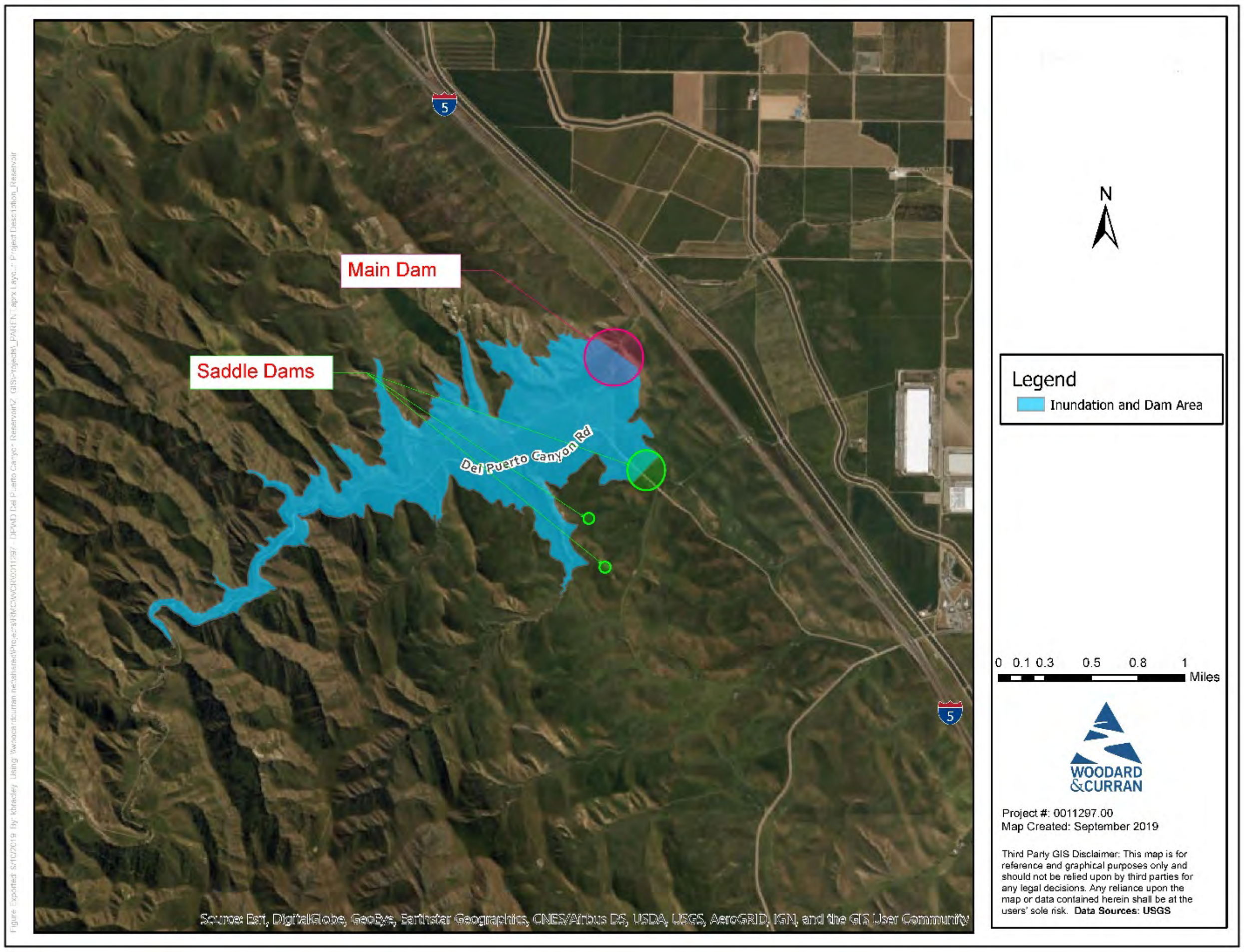
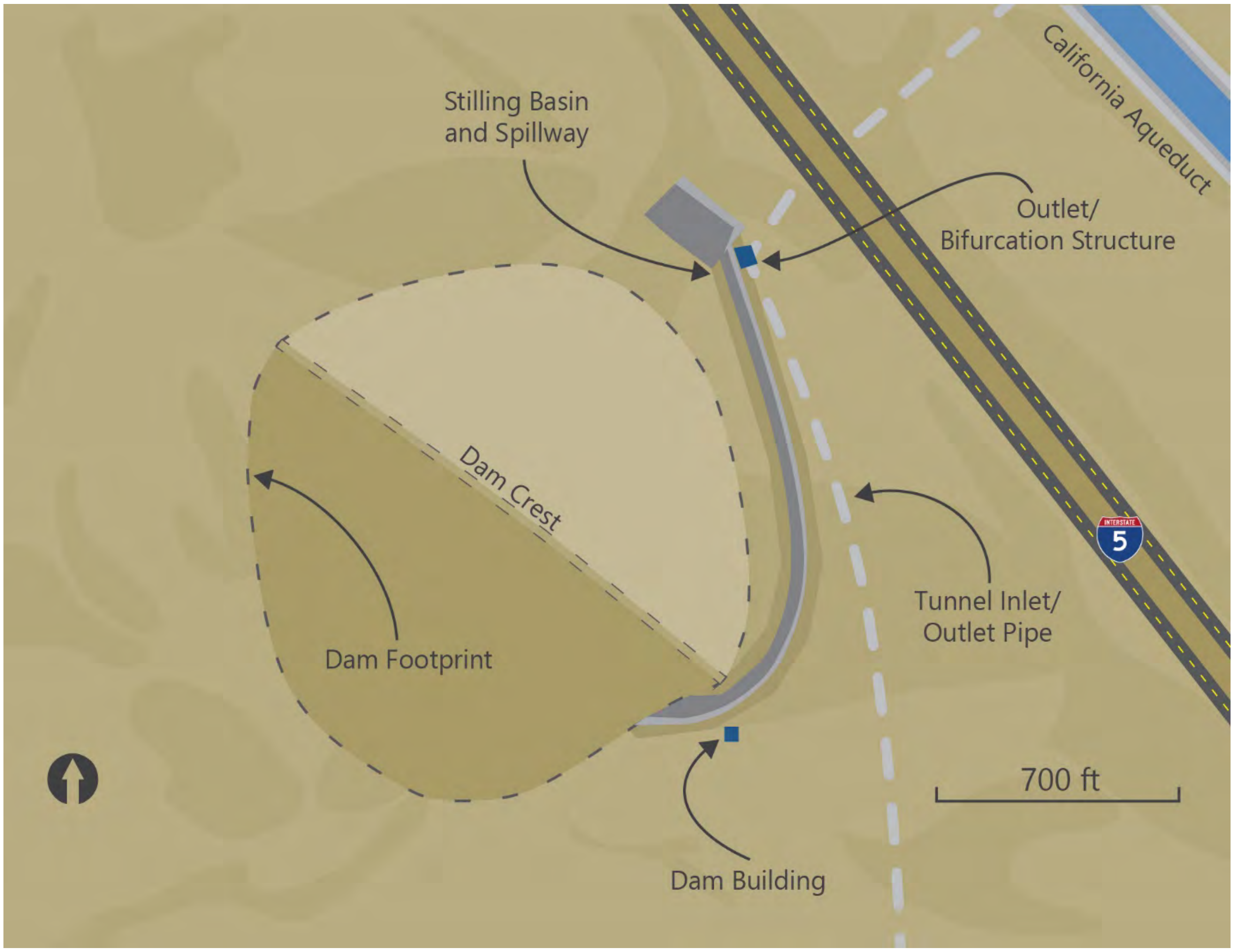


Figure 2-2: Dam and Spillway Illustration

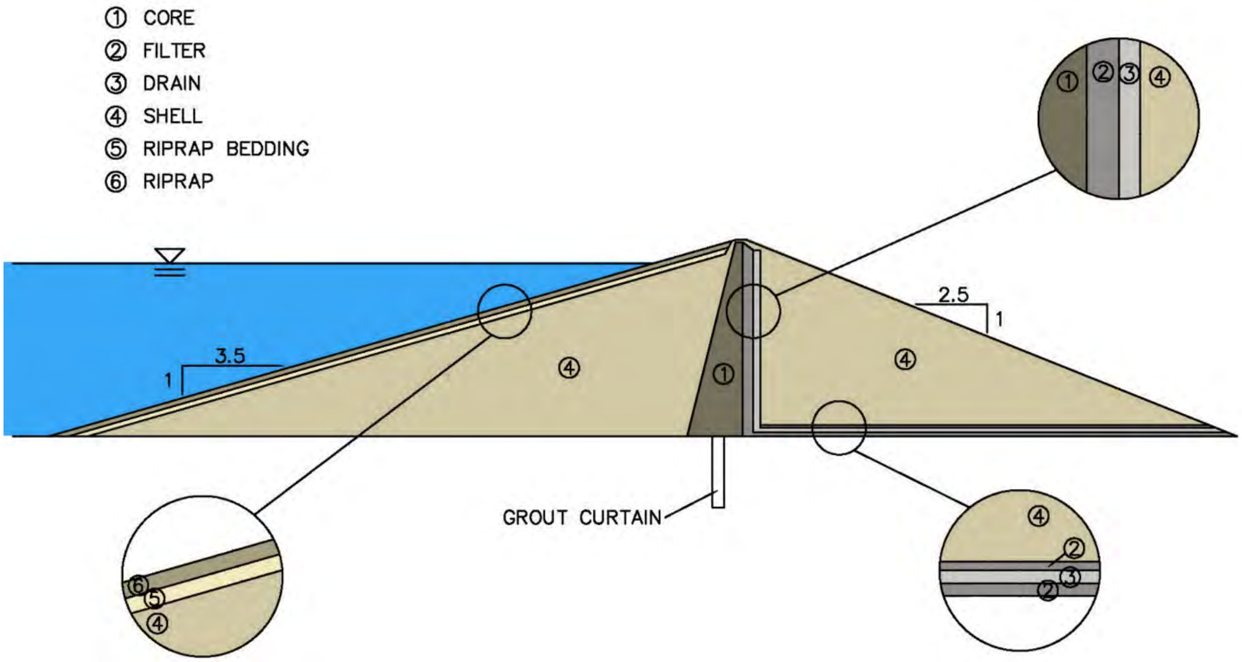


Dams

The proposed project includes the construction of one main dam and three saddle dams, as shown in **Figure 2-1**. The dams would be constructed as zoned earthfill dams because an earthfill dam has greater resilience and ability to safely deform than concrete dams in areas susceptible to high ground shaking events. The main dam would be 1,409 feet long and have a crest width of 30 feet and a crest elevation of 480 feet, creating a reservoir capacity of 82,000 AF at a high-water level of 450 feet; the dam would be about 260 feet high. A conceptual cross section of the zoned earthfill dam is shown in **Figure 2-3**. The dam would consist of a vertical clay core (Zone 1) supported by upstream and downstream shells (Zone 4). The clay core would be 10 feet wide at the top and would widen with depth having a ½H:1V[1] slope on the upstream side and vertical on the downstream side. The upstream shell would be constructed at a slope of 3.5H:1V and the downstream shell would be constructed at a slope of 2.5H:1V.

[1] Slopes are described using the ratio of horizontal to vertical (H:V) change. A structure with a ½H:1V slope would drop elevation by 1 foot for each ½ foot of horizontal distance.

Figure 2-3: Dam Section Concept



The core would be separated from the downstream shell by a vertical chimney filter (Zone 2) and drain (Zone 3). The filter serves to prevent piping[2] of the core in the event the core cracks during settlement or deformation during seismic shaking. The chimney drain collects and conveys seepage through the core and filter to a drainage blanket leading under the downstream shell to the downstream toe. The upstream slope of the dam would be protected against erosion by a 3-foot thick layer of riprap (Zone 6) overlying a 1 ½ -foot thick layer of riprap bedding (Zone 5).

Beneath the core and along the centerline of the dam, a grout curtain would be constructed to control seepage under the dam through the foundation. Depth of the grout curtain would be determined through a field investigation but may extend on the order of 100 feet below the foundation grade of the dam.

The details of the dam configuration would be refined during final design based on dam crest elevation, results of field investigations and laboratory testing of samples from the field investigations, and stability and seismic deformation analyses.

Saddle Dams

Three saddle dams would be located along the southern bank of the reservoir. Saddle dams would be constructed to confine the reservoir created by the main dam and would be located in a low spot or "saddle" through which the stored water would otherwise escape. The crest elevation of the three dams would also be at 480 feet, similar to the main dam. The primary saddle dam would be approximately 153 feet high, with a length of 1,304 feet, and would be located within a side canyon where Del Puerto Canyon Road enters the main canyon that forms the reservoir. Two smaller saddle dams would be located east of the primary saddle dam and would be approximately 11 feet high and 22 feet high, with lengths of 181 feet and 187 feet, respectively.

[2] Soils can be eroded by flowing water, which occurs underground if there are cavities, cracks in rock, or other openings large enough that soil particles can be washed into them and transported away by seeping water. This type of underground erosion can progress and create an open path for flow, called “piping.” Preventing piping is a prime consideration in the design of safe dams.

Spillway

The spillway could be constructed on either side of the main dam, but for purposes of this analysis is assumed to be located on the right abutment (the south valley side against which the dam would be constructed). The spillway would consist of an approach channel with an ungated chute spillway, which transfers water from behind the dam down a smooth decline into a large stilling basin below the dam (**Figure 2-2**). The spillway would be concrete-lined and would follow an ogee curve (a curve shaped somewhat like a half "S") at the crest and a constant slope chute terminating in the stilling basin.

Conceptually, the excavated spillway side slopes are shown as 1.5H:1V. The ogee crest, chute, and stilling basin are all assumed to have a constant width of 80 feet. The energy from flows over the spillway would be dissipated as they pass through the stilling basin prior to discharging into Del Puerto Creek downstream from the dam. The spillway would be proportioned to safely pass the spillway design flood. The actual configuration of the spillway would be determined during final design based on dam crest elevation, results of field investigations, hydraulic analyses, and review and confirmation with the California Department of Water Resources (DWR), Division of Safety of Dams (DSOD). A bridge would be constructed over the spillway to provide access to the main dam embankment from the right abutment.

Inlet/Outlet Works

Water would be pumped into and released from the reservoir via the inlet/outlet works. The inlet/outlet works would consist of an inlet/outlet inclined structure, outlet channel from the creek to the inlet/outlet structure, the inlet/outlet tunnel, and the inlet/outlet bifurcation structure at the spillway stilling basin.

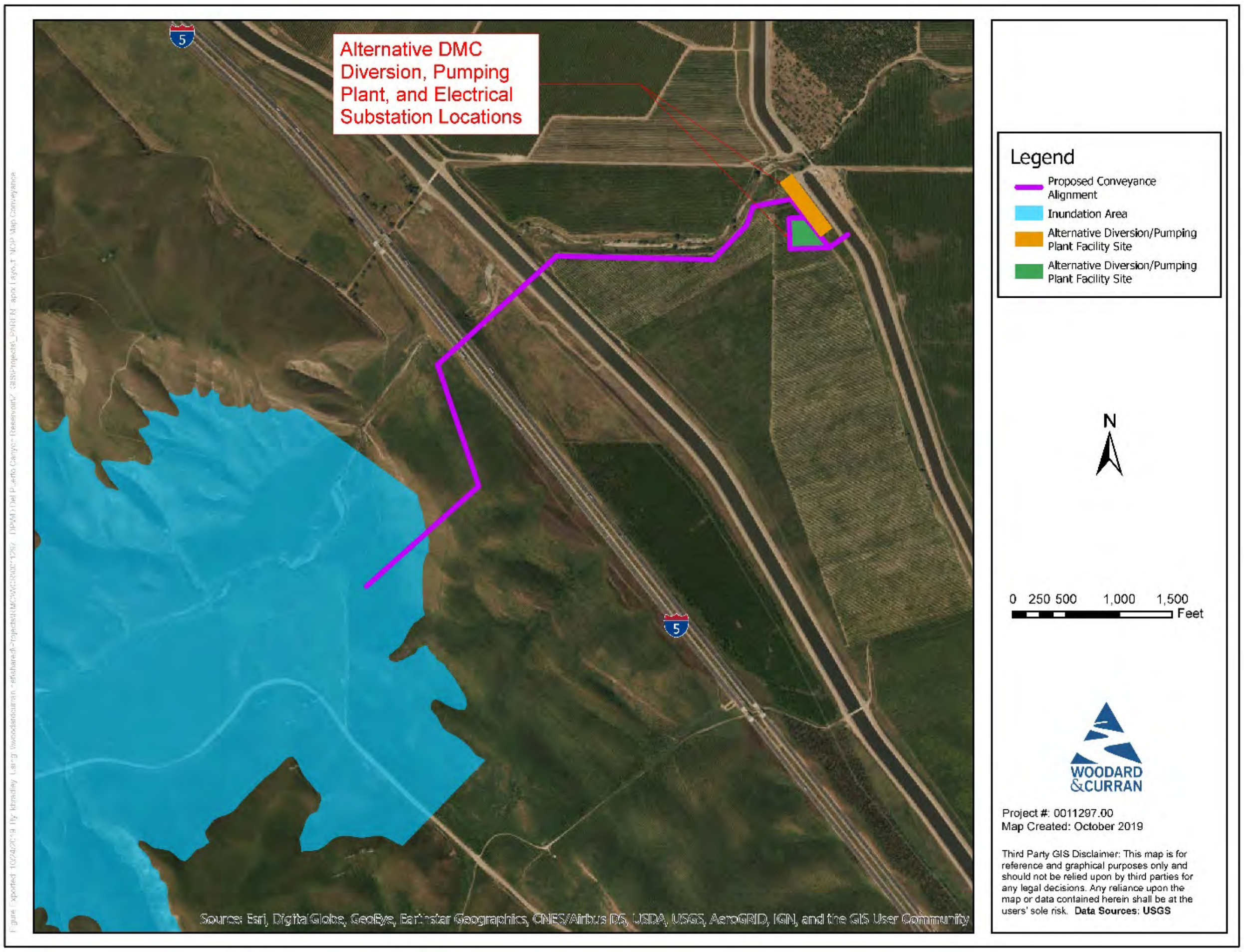
The inlet/outlet works would be located on and through the right shoreline upstream of the main dam embankment and would include a multi-port sloping intake structure with a control building at the top end that will house the gate controls, an outlet tunnel, and an outlet structure consisting of a lift-out chamber and a valve chamber. The outlet conduit would bifurcate downstream of the new dam with one side connected to the conveyance system and the other side connected to valves that would allow for emergency releases, environmental and other flow releases to the spillway stilling basin and Del Puerto Creek.

The ports on the sloping intake structure would consist of hydraulically operated slide gates capable of opening and closing against the maximum unbalanced head. Double-action hydraulic cylinders mounted on top of each gate structure would be operated by a hydraulic power unit in the control building at the top of the intake structure to open and close the gates. The outlet bifurcation structure would be located near the downstream toe on the right abutment east of the spillway. The structure would be an 80-foot-shaft with a reinforced concrete lining that houses the emergency release valve, conveyance line shutoff valve, and creek flow discharge control valve.

2.2.2 Conveyance Facilities

To convey water to and from the proposed reservoir, a buried conveyance pipeline and a pumping plant would be constructed. Based on preliminary calculations, the pipeline would be 84 inches in diameter and would convey up to 380 cubic feet per second (cfs) from the reservoir to the DMC, and the pumping plant would be sized for a total pumping capacity of 300 cfs from the DMC to the reservoir. Potential siting alternatives for the pumping plant are shown in **Figure 2-4**. The conveyance system would deliver water from the DMC into the proposed reservoir and would withdraw water from the proposed reservoir and deliver it back into the DMC. The pumping plant is proposed to be located on the west side of the DMC, on USBR right-of-way directly along the west side of the canal (an alternative location outside of the DMC right of way is also under consideration) and the conveyance pipeline would be located between the DMC and the reservoir inlet/outlet works at the base of the reservoir.

Figure 2-4: Conveyance Pipeline Alignment and Pumping Plant Siting Alternatives



Pipeline

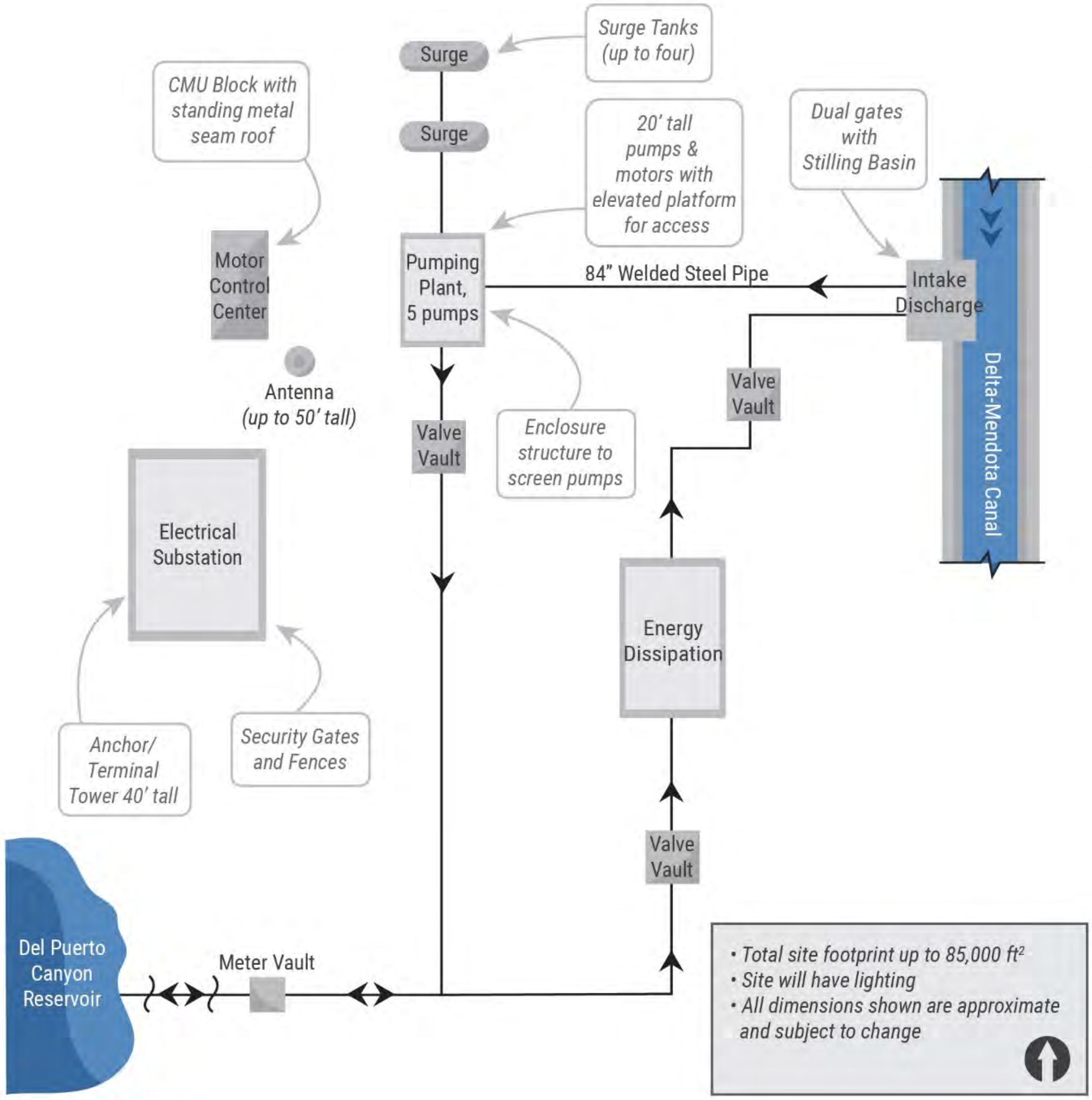
Figure 2-4 shows the pipeline alignment for conveying water to/from the DMC and the reservoir. Pipeline construction would require tunneling under Interstate-5, the California Aqueduct (Aqueduct), and the hills abutting the dam to connect the pipeline to the reservoir and the DMC.

Pumping Plant

The pumping plant would consist of the following components, located at a single 2.25-acre site on federally owned property adjacent to the DMC (see **Figure 2-5**):

- Diversion/outfall structure at the DMC to divert (put) and release (take) water to and from DPCR
- Pumping Plant
- Surge Control Facilities
- Bi-directional Flow Metering (Meter Station)
- Return Flow and Energy Dissipation Facility
- Electrical and Controls Building
- Power Substation
- Yard Piping for Connecting Hydraulic Components

Figure 2-5: Pumping Plant Facilities Schematic



Pumping plant facilities would convey and meter flows from the DMC to the reservoir and the energy dissipation facility would control and meter return flow from the reservoir to the DMC. Water would not flow in both directions simultaneously; water would either be diverted from the DMC and pumped into the reservoir, or water would be released from the reservoir. The combined diversion/outfall structure would be constructed at the existing concrete wall/lining of the DMC. Separate diversion and outfall connections would be constructed, and it is expected that the outfall structure would provide a flow stilling function to the extent needed to avoid hydraulic disruptions in the DMC.

The pumping plant would consist of five 60-cubic-feet-per-second (cfs), constant speed vertical turbine pumps, for a total pumping capacity of 300 cfs. Each pump would be driven by a 2,500 horsepower (Hp) motor, for a total installed horsepower of 12,500 Hp. The pumps would be located on concrete slab within an enclosure. A concrete masonry unit (CMU) block wall would be constructed around the pumping plant site and surge tanks, with taller enclosures around other specific equipment as needed.

Electrical Facilities at Pumping Plant

The pumping plant site would include an electrical substation to supply power to the pumps. Primary power supply lines connecting the substation to existing power supply facilities would be expected to follow the conveyance alignment or an existing power line corridor to the north or south. The electrical substation would consist of tower structures and transformer units on concrete pads, overhead cables, and security fencing.

Access Roadways at Pumping Plant

Access to the diversion/outfall structure, pumping plant and ancillary facilities would be provided by a 16-foot wide partially paved and partially graveled all weather access road that would connect the site to the local public road network and allow vehicle circulation around the plant and to major equipment and structures. The total length would be approximately 1,500 feet.

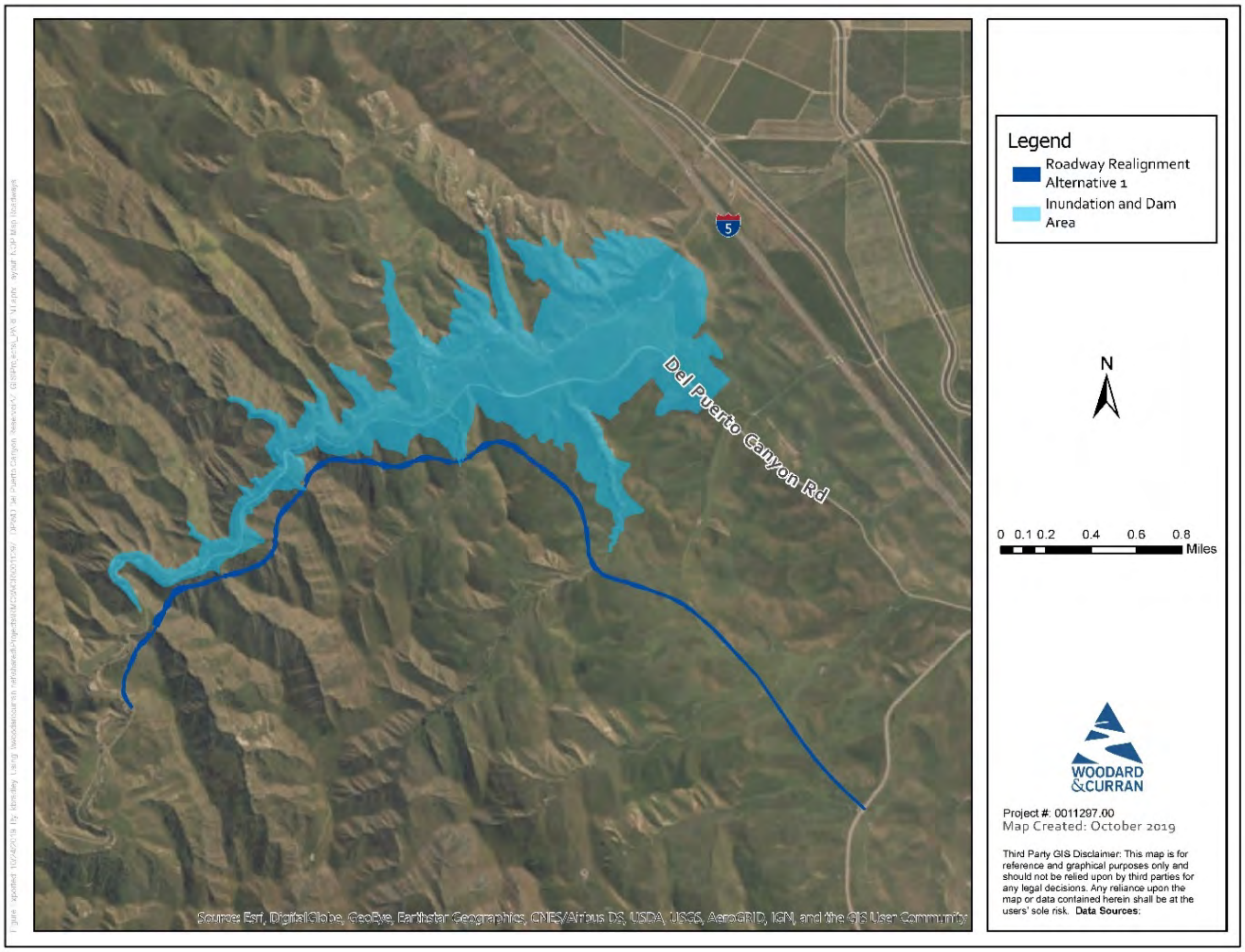
2.2.3 Roadway Relocation

The proposed project requires the relocation of a portion of Del Puerto Canyon Road, which is listed as a Rural Major Collector in the Stanislaus County General Plan and generally runs east-west through Del Puerto Canyon and connects the City of Patterson to Santa Clara County. The portion of Del Puerto Canyon Road that lies within the reservoir inundation area would be relocated. The roadway alignment has been developed at a conceptual level and is subject to refinement during design. Any alignment revision would be evaluated to determine if supplemental environmental documentation is required. The relocated road would have one, 12-foot wide travel lane in each direction with a paved 4-foot shoulder. The total width of the pavement is expected to be 32 feet. Pavement sections would likely consist of 6 inches of imported high quality crushed rock aggregate base topped with 6 inches of bituminous asphalt concrete. Guardrail would be required, and at most valleys and drainage crossings, culverts would convey flow under the road. At some larger drainages, a bridge would be required, but culverts are preferred over bridges if they can be sized and placed appropriately.

The proposed road alignment, developed at a preliminary level by AECOM (2016), would follow the shoreline of the proposed reservoir relatively closely (see **Figure 2-6**). The new road would start at a new intersection beginning at a point along Diablo Grande Parkway approximately 1.3 miles southwest of its existing intersection with Del Puerto Canyon Road. This alignment would run north-northwest until it reaches the south hills along the reservoir. From this point, the road would follow the reservoir shoreline well above the maximum pool elevation, until it intersects with the existing Del Puerto Canyon Road at the upstream west end of the reservoir. The proposed alignment would have a large number of horizontal curves with relatively small radii and would likely require drivers to go slower than the normal design speed for a rural major collector. Guardrail would be required for a high number of tight curves. The new section of roadway would be approximately 24,500 linear feet in total length with an area of about 40 acres, but the total length and size of the roadway footprint could vary depending on final design considerations. Four short bridges may be needed to cross the inundation area at inlets to straighten the alignment so that the road crosses over the inundation areas of the reservoir rather than follow the hillside, and approximately 16 culverts may be needed. To keep the excavations and fills reasonably narrow, about 2,800 linear feet of retaining walls would be needed.

After the new road is complete, the existing portion of Del Puerto Canyon Road between Diablo Grande Parkway and the reservoir would be gated just above the current intersection and would become a private road providing access to the reservoir. Pedestrian access would be provided.

Figure 2-6: Roadway Relocation

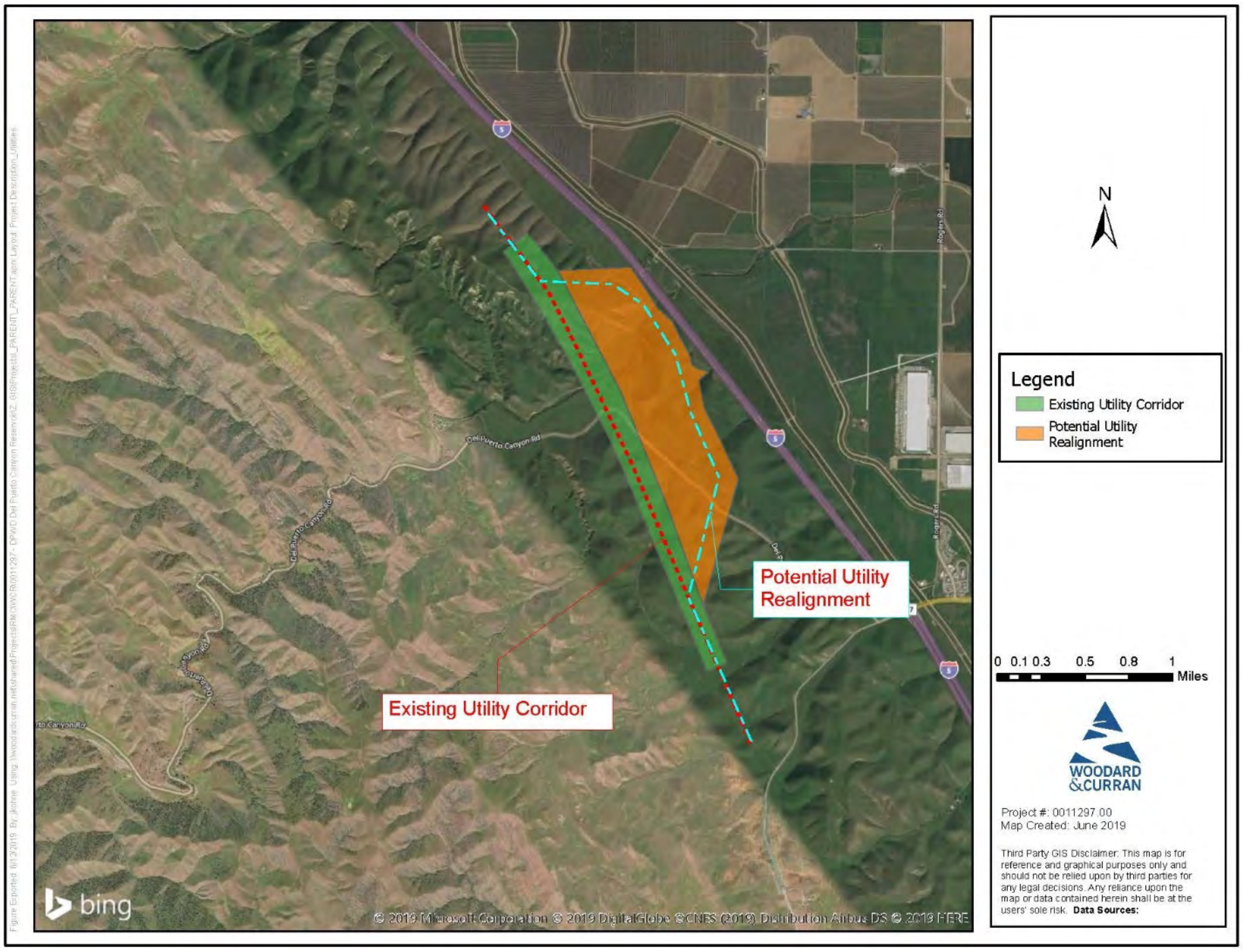


2.2.4 Utility Relocation

The proposed project would be designed to address existing and proposed utilities. Utilities in the area include five existing PG&E high-voltage electric transmission lines and one proposed San Luis Transmission Project high-voltage transmission line, a Frontier Communications buried cable telecommunications line, and a Shell petroleum pipeline[3]. If feasible, powerline towers would be reconfigured to enable the powerlines to cross over the reservoir pool. If infeasible, the power lines and other utilities would be relocated to the front of the main dam, in between Interstate-5 and the face of the main dam, as shown in **Figure 2-7**. It is estimated that a total of 16 steel powerline towers and 13 wooden power poles would need to be relocated to be outside the proposed reservoir footprint if towers cannot be reconfigured to cross the reservoir. Also, four steel towers are currently proposed within the reservoir footprint for the San Luis Transmission Project, and the proposed towers would need to be raised and/or relocated. All utility work would be funded by the project partners, and it is anticipated that the relocated utilities would be designed and constructed by the respective utility owners.

3 The pipeline is currently owned by Shell Pipeline Company, and relocation would be coordinated with Shell or a future owner of the pipeline.

Figure 2-7: Utility Corridor Relocation



Power Lines

Tubular steel monopoles or lattice steel structures would be used to support the relocated transmission lines, with towers ranging in height from 50 feet to 170 feet depending on the actual size of the line to be constructed (e.g. 115-kV, 230-KV or 500-kV). Ancillary communication facilities, including fiber optic overhead ground wires would be installed on the transmission line structures for control and protection. It is estimated that up to 47 steel towers and 30 wooden power poles may need to be constructed for the five relocated transmission lines, and an estimated 11 steel towers of the proposed the San Luis Transmission Project would need to be relocated.

Petroleum Pipeline

The relocated petroleum pipeline would be approximately 9,000 feet in length, 20-inch in diameter and specially fabricated of welded steel with dielectric coating.

Buried Cable Telecommunications Line

The buried cable line located in Del Puerto Canyon Road would be relocated during construction of the relocated section of Del Puerto Canyon Road. The buried cable would follow the road alignment.

2.3 Operation and Maintenance

2.3.1 Operations

The proposed project operations are subject to ~~would be consistent with~~ the Coordinated Operation Agreement and would not affect existing CVP or SWP Delta pumping operations. However, certain federal benefits may be achieved should Reclamation choose to pump additional water that could be stored in capacity made available in San Luis Reservoir by the Project Partners storing water in DPCR, or by shifting pumping to provide additional Delta pumping capacity during periods of peak delivery by pumping water for delivery to the Project Partners during non-peak delivery periods and delivering that water to the Project Partners for storage in DPCR. Any such modification of Delta pumping by Reclamation would be evaluated by Reclamation in a separate NEPA document if such pumping is determined to be outside existing certified environmental documentation and/or operating agreements.

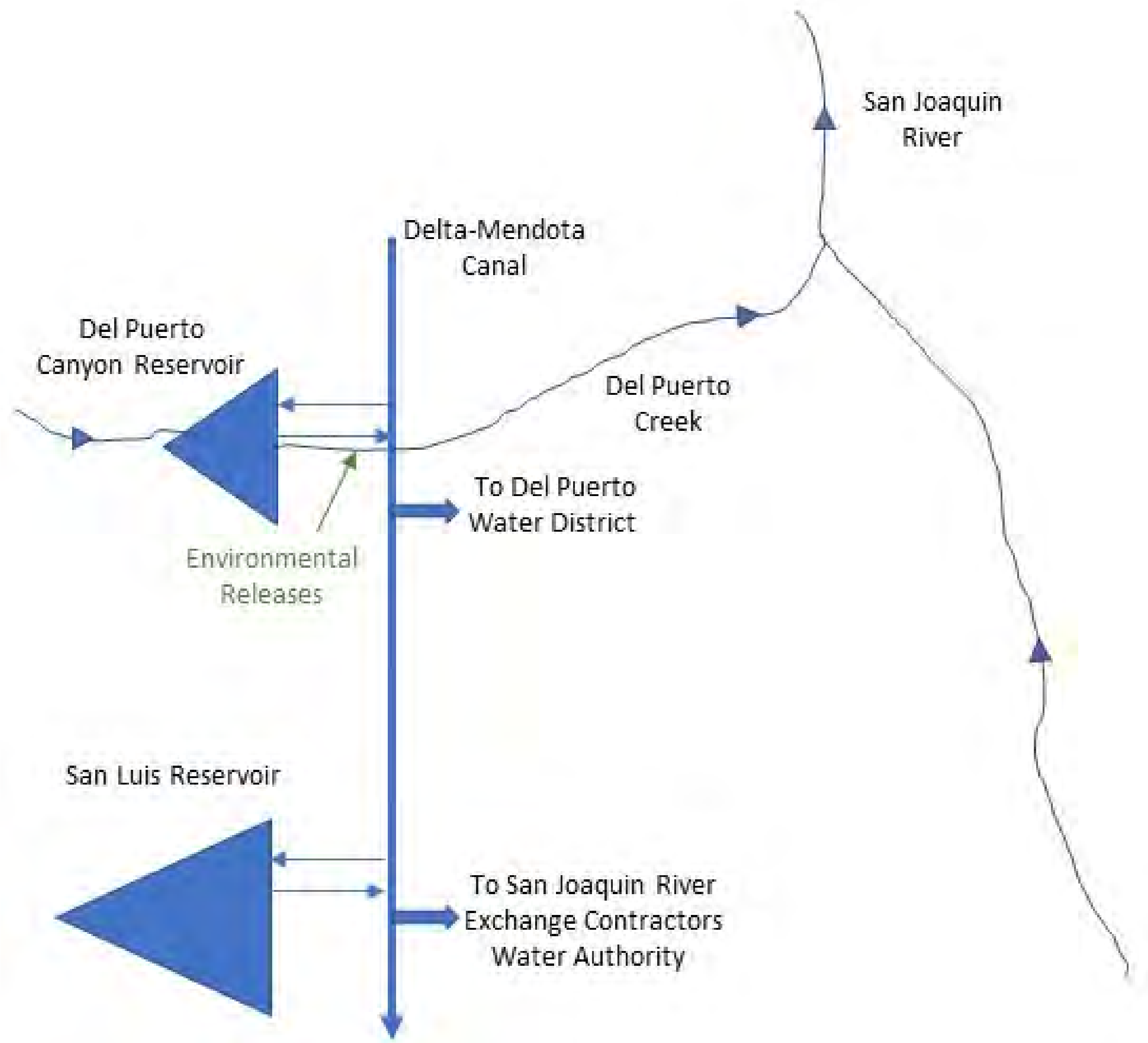
The reservoir would be operated and maintained by local staff, and it is estimated that three to five employees would be needed for operation and maintenance of the reservoir and conveyance facilities. The reservoir would fill primarily by pumping water from the DMC through the conveyance pipeline into the reservoir. Availability of water from the DMC would be dependent on U.S. Bureau of Reclamation deliveries under each existing surface water entitlement available to the Project partners consistent with the Coordinated Operation Agreement between the Bureau of Reclamation and DWR. In addition to CVP supply, the reservoir would receive and store Del Puerto Creek native flows. Both CVP and Del Puerto Creek flows would enter the reservoir when the reservoir level is below the spillway crest, which is at an elevation of 450 feet above mean sea level. Losses from the reservoir would include evaporation and seepage. Releases from the reservoir would include water for delivery to the project partners through the DMC and environmental or regulatory releases to Del Puerto Creek. Operation of the DPCR would be coordinated with CVP and DMC operations.

At a 300-cfs maximum pumping rate, it would require 138 days of continuous operation of the pumping plant to fill an 82,000-AF reservoir from a 1,000 AF deadpool to full. A maximum release rate of 380 cfs capacity to the DMC would require 107 days to empty the full reservoir to a 1,000-AF deadpool level. Reservoir drawdown rates during maximum releases of 380 cfs capacity to the DMC would range between 1.0 and 8.6 feet/day.

Reservoir Operations Model

A model was developed to simulate operation of the proposed reservoir. The model used DWR’s 2017 State Water Project Delivery Capability Report CalSim2 model results as input for available flows in the DMC. A schematic of the inflows into the reservoir, losses from the reservoir, and releases from the reservoir is shown in **Figure 2-8.** The inflows, losses, and releases are described in the following sections.

Figure 2-8: Del Puerto Canyon Reservoir Operations Model Schematic



Inflows

Inflows to the reservoir include Del Puerto Creek flows, which average 4,624 AF per year (AFY), and the Project Partners' Bureau of Reclamation surface water supply entitlements. The volume of supply available from Bureau of Reclamation inflows is based on CalSim output for the Project Partners from 1921 through 2003, which averaged 65,548 AFY (49.6 percent average allocation) for DPWD and 682,329 AFY (97.5 percent average allocation) for the Exchange Contractors. In addition to available supply, modeled inflow into the reservoir is constrained by operational rules specified for each project partner and capacity constraints related to DPCR infrastructure.[4] Del Puerto Creek inflows for the model were assumed to be similar to historical flows recorded at the Del Puerto Creek USGS gaging station

[4] Recycled water from the North Valley Recycled Water Program is assumed to be used directly and would not be stored in the reservoir. However, recycled water supply is modeled as part of the DPWDs total supply and demand. It is assumed that 18,200 AFY of recycled water is produced and used in a monthly pattern specified by DPWD.

between 1965 and 2018. A synthetic hydrograph for Del Puerto Creek was created to extend the hydrology back to 1921 to match the temporal scope of CalSim's output (1921-2003). CalSim output for Project Partners' CVP allotment from 1921 through 2003 was used in the model as estimated CVP inflows. Upon execution of appropriate agreements to ensure allocation of costs and benefits, up to 20,000 AF of storage could be provided for management of South of Delta operations.

Reservoir Losses

Reservoir losses include losses due to evaporation and seepage. California Irrigation Management Information System monthly pan evaporation data from 1987 through 2019 from Modesto, located 11.7 miles away, were used to estimate evaporation from the reservoir in the model. The model calculates evaporation based on the month, and on the reservoir level using an estimated storage-elevation curve for the proposed reservoir; evaporation varies seasonally, but averages about 118 AF per month. Seepage averages 75 AF per month.

Reservoir Releases

Reservoir releases include releases to meet Project Partner demand and releases to meet environmental or regulatory commitments made during development and permitting of the project. For the purposes of analysis, modeling of the proposed environmental releases was based on a set of general operations rules for releasing flows during peak flow events. For every flow event of 500 cfs or greater, environmental releases would be made in a pattern that mimics the unimpeded flow in Del Puerto Creek based on a new stream gage that would be installed upstream of the proposed impoundment area. If the stream gauge measurement exceeds 500 cfs then releases would increase on for the first day of the environmental release program mimicking the measured natural flow, with flows up to 600 cfs, or the peak natural flow (whichever is less). After the first day there would be up to six additional days of releases with a decreasing flow rate in each subsequent day, eventually returning to at or near zero releases after no more than 7 days.

The maintenance of these flows is intended to preserve key characteristics of the natural flow regime that drive key geomorphic and ecological processes supporting native aquatic species, including the delivery of coarse sediment that currently contributes to the maintenance of white sturgeon habitat in the San Joaquin River (Marineau et al. 2017). Short, periodic high flow releases would mimic the natural intermittent flashy flows on Del Puerto Creek, which appear to be important for conveying gravels from the creek into the river.

2.3.2 Reservoir Management Plan

The Project Partners would develop a reservoir management plan to protect water quality of the reservoir and to minimize the potential that conditions in the reservoir would allow harmful algal blooms to occur. The plan would include reservoir water quality monitoring and would provide effective early warning of the potential occurrence of algal blooms in the reservoir and ensure algal blooms are not exported from the reservoir. Water quality management would include the following two measures:

1. **Water Quality Monitoring**

    a. Annual seasonal monitoring for cyanobacteria shall occur monthly, at a minimum, beginning April 15 and continuing through October. Monitoring shall begin earlier than April 15 if algal blooms are suspected. Initial early-season monitoring shall consist of visual inspection as well as water sampling. Visual monitoring shall be implemented consistent with the State Water Resources Control Board's (State Water Board's) Surface Water Ambient Monitoring Program (SWAMP), Visual Guide to Observing Blooms in the SWAMP HAB Field Guide (SWRCB 2017a). If visual inspection from several sites along the perimeter of the reservoir does not detect any signs of a bloom(s), then a single water sample both from a location near the reservoir's inlet/outlet and a location immediately downstream of the inlet/outlet would suffice. A qualified water quality specialist or otherwise appropriately trained person shall obtain grab samples of reservoir water from these locations.

b. Qualified personnel conducting water sampling shall follow all applicable steps in the State Water Board's SWAMP standard operating procedures for sampling site reconnaissance from the SWAMP HAB Field Guide (SWRCB 2017b) or develop a similar protocol to maintain consistency in sampling and record keeping. This standard operating procedure is intended to describe general and specific methods, procedures, and considerations on documenting the spatial and logistical aspects of each sampling site.

c. Water samples shall be taken and analyzed by trained personnel using field or laboratory methods to identify cyanobacteria cell density (cell counts) and cyanobacteria species (to identify whether cyanotoxin-producing species are present). In addition to water samples, water temperature, dissolved oxygen, pH, conductivity, and turbidity shall be recorded at each sampling location.

d. The state's recommended "caution action trigger" for cyanobacteria cell density of toxin producing cells is 4,000 cells per milliliter (cells/ml) (SWRCB 2018). When waters exceed this count, the State Water Board recommends caution signs be posted for recreational waters. Although recreation is not proposed for the DPCR, the Project Partners would either use this threshold or coordinate with the State Water Board to establish a higher threshold. Should the Project Partners choose to work with the State Water Board to establish a higher threshold, the Project Partners can use the World Health Organization guidance/action levels for cyanobacteria in recreational waters, which is less conservative—a cell density of less than 20,000 cells/ml corresponds to a low relative probability of acute health effects (USEPA 2017).

e. Visual and water quality reservoir monitoring would continue on a regular basis until cell density at any monitored location exceeds the established threshold and/or the reservoir surface elevation threshold (established in coordination with the State Water Board). An established elevation threshold is required to ensure that if there are algal blooms, there is a reasonable vertical margin within the water column relative to the water's surface in which cyanobacteria are not present and thus would not be drawn into the outlet with exported water. Although cyanobacteria mostly accumulate near the water's surface, they can be distributed throughout the photic zone in a bloom, the depth of which would vary. If water sampling results indicate that cyanobacterial cell density is approaching the established density threshold, the frequency of visual inspections shall increase.

f. If either the cell density is at or above the established density threshold, or the reservoir surface elevation drops below the established elevation threshold, the following action plan shall be implemented:

2. **Action Plan**

   a. Reservoir monitoring and water sampling frequency shall increase to weekly.

   b. Advisory warning signs noting the presence of algal blooms shall be placed in visible locations around the reservoir, and reservoir operations staff shall all be notified and be made aware of the potential health risks associated with cyanobacteria and cyanotoxins.

   c. If cyanobacterial cell density continues to exceed the established threshold during the seasonal monitoring period and the reservoir surface elevation approaches 212 feet above mean sea level (the elevation of the inlet/outlet works), then the export of water from the reservoir shall be discontinued until the reservoir surface elevation increases and the potential for drawing cyanobacteria into the outlet is no longer a concern or until cyanobacteria cell density has dropped below the established threshold.

d. Caution and safety procedures shall be used to prevent direct contact with a bloom. The State Water Board's SWAMP Health and Safety Guide (SWRCB 2017c) from the SWAMP HAB Field Guide can be consulted to provide information for personnel protection to minimize risks during water sampling.

2.3.3 Maintenance

Reservoir maintenance would include weekly inspection trips in the first year of operation. Inspection trips would be reduced in frequency over time with trips every two weeks in years two through five of operation and monthly trips starting in year six. Operation and maintenance of the pumping plant is estimated to require on average of one worker vehicle trip per day to conduct inspections and maintenance of pumping plant facilities.

Maintenance for proposed project facilities would include debris removal, dredging, vegetation control, rodent control, erosion control and protection, routine inspections (dams, tunnels, pipelines, pumping/generating plants, inlet/outlet works, fence, signs, gates), painting, cleaning, repairs, and other routine tasks to maintain facilities in accordance with design standards after construction and commissioning. Routine visual inspection of the facilities would be conducted to monitor performance and prevent mechanical and structural failures of proposed project elements. <u>The reservoir area would be inspected via utility and access roads, and if any trespassers are present, they would be reported to local law enforcement as appropriate.</u>

Maintenance activities associated with the proposed inlet/outlet works could include cleaning and removal of sediments, debris, and biofouling materials. These maintenance actions could require suction dredging or mechanical excavation around intake structures; dewatering; or use of underwater diving crews, boom trucks or rubber wheel cranes, and raft- or barge-mounted equipment.

Maintenance activities associated with the proposed conveyance pipeline would likely occur once per year, with possible additional inspections and maintenance needed after storm or flood events. Dewatering for inspection may occur in 5-year cycles or when a pipeline problem is suspected.

2.3.4 Potential Future Uses

The reservoir is currently proposed to be used only for water storage; no additional uses of the reservoir for recreational purposes are included in the Project Partners' plans for the reservoir site. There has been local interest in the possibility of recreation at the reservoir, and the Project Partners are open to Stanislaus County developing recreation near the reservoir in the future. The reservoir site could provide upland recreation such as camping, hiking and picnicking, but the reservoir is not expected to be suitable for water-based recreation and fish stocking would not be allowed. The reservoir slopes would be steep, and the reservoir would be filled and drained frequently, resulting in extreme changes in water levels. Because of irrigation demands the water level would always drop substantially in the summer making recreational water activities dangerous as new hazards would appear regularly. Should Stanislaus County propose developing a recreation area near the reservoir, separate environmental review would have to be conducted for the recreational facility.

2.4 Construction Considerations

Prior to initiation of construction activities, acquisition or establishment of temporary or permanent easements on private properties would be required. Overall, construction of the proposed project is expected to take approximately six years. Several factors affect this anticipated schedule, including funding, environmental compliance, contracting methods and strategies, material and construction equipment availability, lead time for fabrication of major pipe, pumping and generating equipment, labor force constraints, weather, and access road capacity limitations. Additional adjustments to the schedule would be addressed as required during project development and implementation.

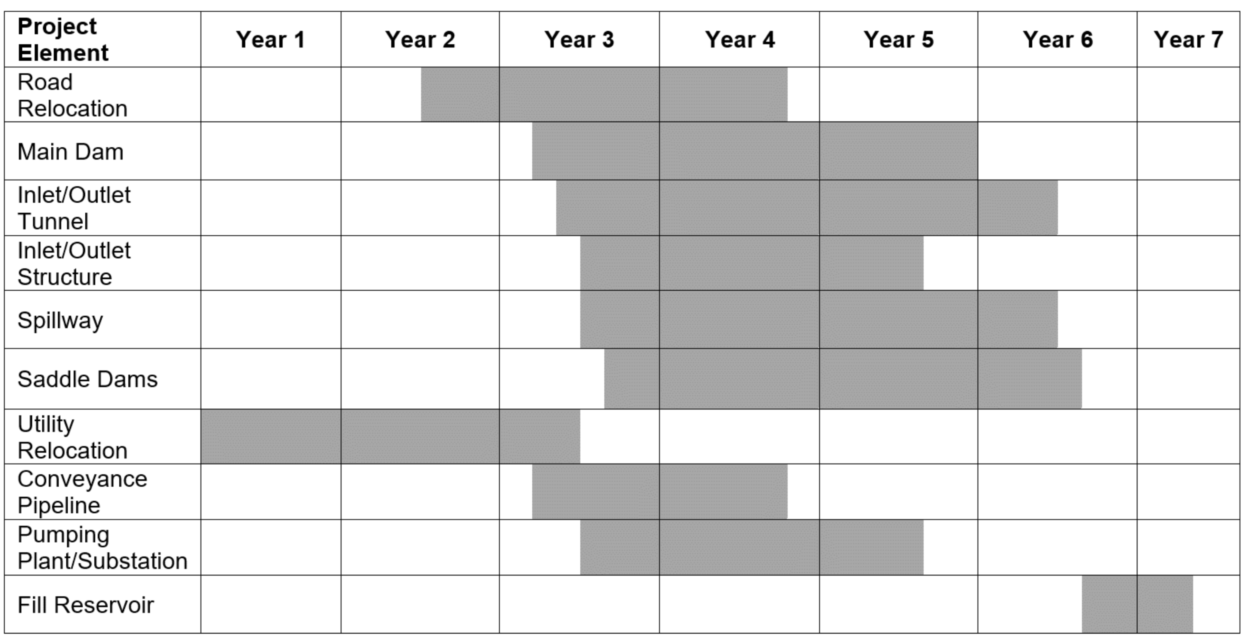
2.4.1 Construction Timing & Sequencing

Construction of the pumping plant, conveyance, roads and powerlines would occur between 7:00 a.m. and 7:00 p.m. Nighttime and weekend construction would occur on an as-needed basis and would be coordinated with area residents. The portion of the conveyance pipeline that would be constructed by tunneling could require nighttime construction. If nighttime construction is needed, construction lighting and noise constraints consistent with applicable local requirements would be used. Nighttime construction would not be conducted between 10:00 p.m. and 7:00 a.m. within 1,000 feet of occupied residences. Construction of the reservoir and dam facilities would require nighttime construction. Two 10-hour shifts are proposed, with construction taking place between roughly 5:00 a.m. and 1:00 a.m. five days a week. Construction areas would be lighted to allow work to continue at night.

Construction would be confined to designated construction disturbance areas. Construction vehicle parking and storage of equipment and materials would also occur within these construction disturbance areas. Construction bid specifications and design packages would include site designation regarding special or sensitive sites. Special or sensitive sites within the construction disturbance areas would be clearly marked and fenced with orange barrier fencing before any construction or surface-disturbing activity begins. Construction personnel would be trained to recognize these markers and understand where construction equipment and materials would not be allowed. Lath, fencing, or flags would be maintained until final cleanup and/or site restoration is completed, after which they would be removed.

Durations of construction were estimated for only the most significant critical path features of work based on quantities of that work and experience on other projects of similar magnitude. Estimated duration of construction also considered the logical sequence of work allowing for concurrent activities where possible. Construction may start as early as 2022, but would be dependent on the timing of funding, design and permitting. Some aspects of reservoir construction can take place concurrently with road relocation, but the existing Del Puerto Canyon Road would not be closed until the new road is ready for operation. Construction of the project components would be expected to occur in the sequence shown in **Figure 2-9.**

Figure 2-9: Construction Sequence



2.4.2 Staging Areas

Staging areas would be within the designated construction area and would be set up in close proximity to work areas, including the main dam, saddle dams, inlet/outlet structures, conveyance pipelines, pumping plant, new roadway location, and utility relocation corridors. Staging areas would be required for the contractor's office trailers and construction materials storage.

2.4.3 Construction Spoil

Construction spoil would be generated from construction activities associated with both the dam facilities and the conveyance facilities including tunneling, pipeline, and excavation work. Excavation work would be conducted around the spillway, inlet/outlet works, and foundation of the main dams and saddle dams. Tunneling would occur in the area around the dam and for the Interstate-5 and California Aqueduct crossings. All excess spoil generated from project construction would be deposited in the inundation area after crews quarry the materials necessary for the dams.

2.4.4 Dam Facilities Construction

The reservoir includes the dam, spillway, and inlet/outlet pipe as shown in **Figure 2-2**. Construction of these facilities is described in the following sections.

Sources of Construction Materials

It is currently envisioned that some construction materials for the dams would be sourced on-site. Clay core material would likely be on site. Shell material would be sourced from required on-site excavations for the dam foundation and borrow areas in the inundation area. Based on a preliminary review of commercial suppliers of natural aggregate materials for filter and drain, four potential sources were located within 27 miles of the site. Riprap bedding and riprap would be sourced from commercial hard rock quarries most likely in the Sierra foothills between 70 and 100 miles from the site. No off-site borrow areas are currently planned.

Construction of the Dam

Division of Safety of Dams Requirements

Design and construction of the reservoir would meet all requirements of the California Department of Water Resources Division of Safety of Dams (DSOD) and applicable current Federal dam safety guidelines and criteria for a new dam, reservoir and appurtenant facilities. Design criteria for the dam, saddle dams and reservoir include, but would not be limited to the following:

- The embankment, foundation, abutments, and appurtenant facilities must be stable under all conditions of construction and reservoir operation including seismic.
- Seepage through the embankment, foundation, and abutments must be filtered, collected, controlled measured and monitored to prevent excessive uplift pressures, piping, sloughing, removal of material by solution, or erosion of material by loss into cracks, joints, and cavities.
- Freeboard must be sufficient to prevent overtopping by waves and include an allowance for the normal settlement of the foundation and embankment as well as for seismic effects where applicable.
- Spillway capacity must be sufficient to prevent overtopping of the embankment during passage of the spillway design flood and must provide adequate energy dissipation before returning flows to the natural stream channel.
- Outlet works capacity must be sufficient to satisfy environmental releases, minimum reservoir evacuation criteria and project needs and must provide for adequate energy dissipation before returning flows to the natural stream channel.

- Reservoir rim stability associated with existing or potentially newly developed landslides must be sufficient to safely operate the reservoir under all conditions of construction and operation, including seismic.
- The reservoir facility, including main dam and saddle dam embankments, foundations, and abutments, and spillway must be stable during the design earthquake[5]. A deterministic and probabilistic seismic hazard analysis would be conducted to account for the anticipated estimated levels of ground shaking and deformation that could occur due to regional and local earthquake sources. Seismic hazard evaluations would include detailed assessments of fault rupture, ground shaking, ground deformation, ground failure, and liquefaction, in coordination with DSOD. Prior to reservoir infilling, a seismic monitoring array would be designed and implemented as part of the project to monitor site seismic activity. The seismic monitors would remain in service over the life of the project and would be part of the dam safety monitoring program.

Construction Activities

Dam construction would consist of the following activities:

- Site preparation, including creek diversion;
- Construction of the embankment, which includes foundation clearing and excavation; foundation preparation and grouting; excavation of borrow material within the reservoir; and fill placement and compaction;
- Construction of the inlet/outlet works;
- Construction of the spillway;
- Site restoration.

Site Preparation

Staging for initial construction activities would be within the proposed footprint of the dam and reservoir. A piped bypass would be used for diversion of Del Puerto Creek as the main dam foundation is excavated and grouted. The creek would be bypassed into the inlet/outlet tunnel so that the dam embankment can be constructed across the creek. The bypass would continue until construction is complete. Lining of the inlet/outlet tunnel with finished pipe would be done during summer when no creek flow is present, and the creek would be connected to the bypass structure during the dry season. Once the finished liner is in place, the creek would continue to flow through the completed tunnel until the reservoir is filled.

Construction of the Embankment

Along the dam foundation, a core trench would be excavated down through rippable material (material that can be excavated using conventional equipment) to rock refusal (i.e., the point at which further excavation is infeasible), the depth of which would be determined in the field during construction. A concrete grout cap would be constructed across the bottom of the trench to provide a suitable surface for performing drilling and grouting operations. Drilling for the grout curtain would extend down to approximately 100 feet below the foundation grade of the dam.

The embankment would be constructed in horizontal lifts of fill materials. Each horizontal lift above the blanket drain level would contain four different types of materials placed in five separate zones. These materials are: 1) fill core material; 2) upstream and downstream fill shells; 3) fine drain fill; and 4) coarse drain fill in the chimney drain. Typical dam construction involves placing different types of fill material,

[5] The design earthquake is the level of earthquake ground motions specified for use in design of a facility. The earthquake ground motion levels consider documented potential seismic hazards and site-specific conditions among other factors.

which are compacted concurrently with each horizontal lift. The average lift surface area at the dam is estimated to be approximately 478,300 square feet, which allows for multiple spreading, compacting and testing crews to work concurrently on a given lift. Stockpiles of fill materials within the dam footprint would be accessible by haul trucks and delivered to the lift surface at the dam embankment areas. The haul road would be looped to provide one road in, and a separate road out for efficient haul truck traffic flow.

Construction of the Inlet/Outlet Works

To construct the outlet works, the foundation would be excavated, and cast-in-place concrete formwork would be installed. Reinforcing steel would be placed and concrete would be placed and cured. Once the concrete has cured the forms would be removed and the intake gates and controls would be installed in the structure. Barrier and bridge decks and railings would be installed along with any guardrails, fences and signage.

Construction of the Spillway

The spillway would be excavated in rock and lined with reinforced concrete.

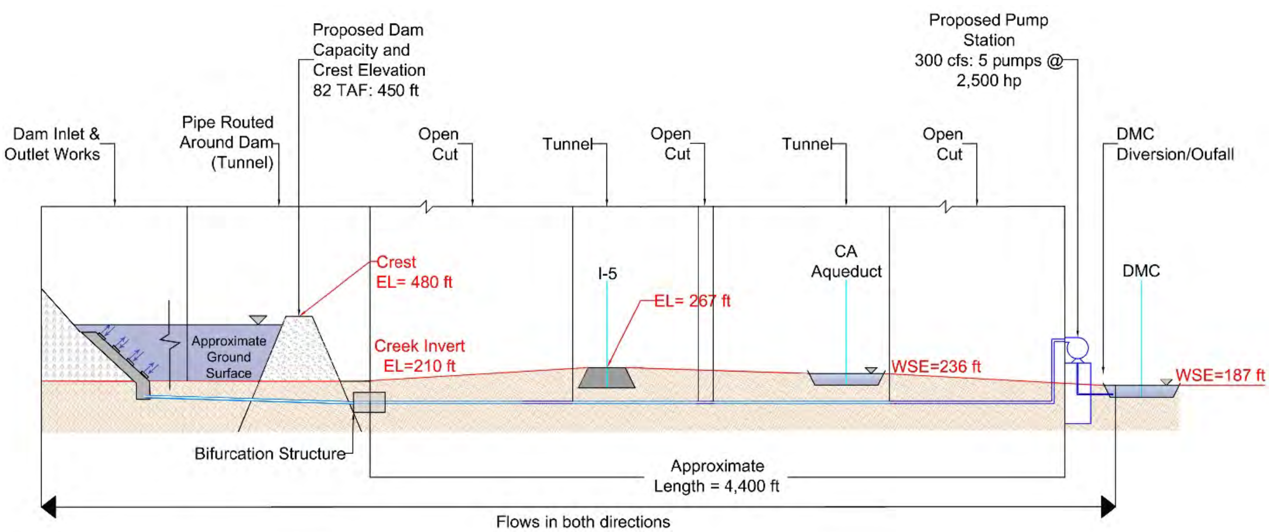
Site Restoration

Once construction of the dam facilities is complete, the downstream face of the dam and the disturbed areas around the spillway and stilling basin would be revegetated to limit surface erosion. The disturbed areas outside the area of inundation would be restored to their original condition. The inundation area would be prepared for filling by stabilizing slopes, removing woody vegetation and debris and removing improvements.

2.4.5 Construction of Conveyance Facilities

The conveyance facilities include the pipeline, diversion/outfall structure at the DMC, pumping plant and electrical facilities. A cross section of conveyance elements of the proposed project is provided in **Figure 2-10**. Construction of the conveyance facilities is described in the following sections.

Figure 2-10: Project Cross Section Schematic



Pipeline

Conveyance of water from the DMC to the reservoir would include a conveyance pipeline that would be installed with 6-10 feet of cover in open trench cuts between the DMC and the Aqueduct, and an open trench cut for a short reach west of I-5 to the bifurcation structure. The lengths of these open cut reaches would be approximately 2,500 feet and 550 feet, respectively and the construction easement would be 100 feet wide for a temporary construction footprint of about 7 acres.

In between these reaches, tunneling would be utilized for installing the pipeline where it would cross under the Aqueduct and I-5 for approximately 1,350 feet. The pipeline would be connected to the bifurcation of the outlet works. The pipeline would be about 84 inches in diameter for a flow of 300 cfs and 380 cfs, into and out of the reservoir respectively based on preliminary calculations.

Open-cut construction

To accommodate construction equipment and work area, the entire construction corridor (active work area including the trench) would be approximately 100 feet wide. It is expected that the construction may require closure of some farm roads unless temporary access for construction equipment can be provided along the shoulders of the road and/or adjacent property. If access can be provided along the roadway shoulders and adjacent property, only partial road closures with appropriate traffic control would be required.

It is expected that open trench construction would proceed at the rate of 100 feet per day. Excavated trench materials would be side cast within approved work areas and reused as appropriate for backfill. The open-cut construction proposed would be within areas of farmland that is not currently cultivated. If open-cut construction is proposed for cultivated areas, it may require removal of the crop, depending on the crop and time of year. Temporary and permanent easements would be obtained from individual property owners and growers as needed.

Trenchless Pipeline Construction

Trenchless construction methods would be used for specific crossings where open-cut construction is not practical or not allowed. Tunneling would be used for crossing under Interstate-5 and the California Aqueduct (about 1,350 feet), as well as at the inlet/outlet tunnel through to the south abutment ridge (about 2,500 feet).

The proposed tunnels are anticipated to be constructed in dense sands, gravels, and rock. Because of this, the tunnels would be constructed using a tunnel boring machine (TBM) or road headers. Each tunnel would require appropriately sized launching and receiving shafts to accommodate TBM retrieval. If dense gravels, cobbles, or boulders are encountered in the older alluvium at depth, other mining methods may be utilized to facilitate tunneling, such as grouting, jet grouting, use of a slurry TBM, or freezing and hand mining. All shaft locations may also require dewatering activities. Dewatering systems would be designed and operated to control seepage pressures in the vicinity of the main bore and the vertical shafts to ensure that excavations remain stable. Discharge water would be conveyed to aboveground treatment facilities to comply with permit conditions before being discharged.

Combined Diversion/Outfall Structure

Construction of the intake/outfall structure would entail installation of a temporary steel cofferdam inside of the DMC to facilitate excavation of ground adjacent to and outside of the DMC lining and removal of an approximately 24-foot section of the DMC lining. The cofferdam would allow for construction of the diversion/outfall structure to be completed without impact to normal operation of the DMC. The concrete intake/return structure would be constructed within the opening created by removal of the liner. Coarse trash racks would be installed within the structure to prevent large debris from entering the pumping plant intake (suction) piping, and slide gates would be installed to allow for isolation of the intake and suction piping. Cofferdams would be removed after the intake/return structure is completed.

Pumping Plant

Construction activities at the pumping plant site would entail mobilization and clearing of the site. Excavation for structures and pipelines would involve dewatering and temporary shoring of excavations.

The pipe would be installed, and the trench would be backfilled. Concrete would be placed for slabs and structures. Above-grade buildings would be constructed (concrete masonry unit walls with metal trusses and roofs). Above grade mechanical piping and equipment, (including surge tanks, pumps and motors, valves and other piping appurtenances) would be installed. The electrical substation would also be constructed (see description below). Work would conclude with final site grading, and installation of drainage, paved and graveled access roads, and fencing.

Electrical Substation

Construction of the substation would begin with site grading, followed by construction of foundations for steel support structures including support busses, utility poles, overhead conductors, and instrumentation. Construction of the foundation (piers) would require augering of holes and placement of steel, setting forms and placement of concrete. A rectangular concrete pad would be constructed for spread footings.

Erection of the new supporting steel structures would be accomplished in sections and supported by the foundations. The activities would include delivery of support structure components to the staging areas and the installation site. Support structure towers and tubular steel poles would be assembled at the staging areas or adjacent to the foundation sites and raised in place with a large crane. A smaller crane would be used to assemble support structure components and to lift heavy steel structures in place.

Other work includes:

- stringing the conductors, which involves installation of insulators to the ends of structure cross arms and puling conductors to the final tension position;
- construction of concrete foundations for electrical equipment;
- installation of electrical equipment, delivered by flatbed trucks and lifted by a crane for placement over the concrete pad; and
- placement of crush rock over the site area and installation of a chain-link fence for site security.

For construction of the distribution lines, placement of utility poles for the distribution lines would require the use of an auger to dig the hole for the erection of the power poles. Poles, conductors, and accessories would be delivered via a semi-trailer flatbed. The cross arms and insulators would be bolted to the poles and the assembly completed on the ground. The assembled poles would be lifted with a line truck, set in the hole, and then backfilled with native material. Once poles are set in place, the cable would be installed and be fed through the stringing sheaves at the end of each insulator, tensioned and strung to the other end.

2.4.6 Roadway Relocation

Roadway construction would involve earthmoving to establish an acceptable grade for a roadbed. The soil in the area is expected to be of adequate quality to use for embankment fill. Small radii horizontal curves would likely be avoided by excavating hillslope protrusions, and spoil from that excavation would be placed in hillslope recesses to create a more desirable road configuration.

Culverts and bridges would be placed as needed. Where bridges are required, concrete would need to be poured first and then cured between 14 to 28 days. Other construction activities could occur during this time depending on how the contractor decides to stage and schedule the overall project. Following grading and placement of bridges and culverts, the road structural section would be constructed with 6 inches of imported high quality crushed rock aggregate base topped with 6 inches of bituminous asphalt concrete.

2.4.7 Utility Relocation

The existing high voltage transmission lines, petroleum pipeline and telecommunications line, and the proposed San Luis Transmission Project transmission line would be affected by the proposed reservoir and would require adjustment. Preferred adjustment for the overhead power lines involves restringing to accommodate the reservoir. A potential utilities corridor for the high voltage transmission lines is shown on **Figure 2-7**, which also includes the potential alignments for relocation of the petroleum pipeline. The telephone line that currently runs along the existing alignment of Del Puerto Canyon Road within the project footprint would be abandoned and relocated to run along the relocated portion of Del Puerto Canyon Road. Design of the relocations and initial coordination with the various utility owners would determine the ultimate method of relocation.

Power Lines

Relocation or raising of power lines would require grading of construction staging areas, grading and drilling holes for new structure foundations, constructing and improving roads for vehicle and equipment access, and establishing pull sites for conductor installation. Most structures would have concrete foundations. Structure components would typically be transported to the sites by truck or helicopter. Structures would be assembled, erected with cranes, and then attached to the foundations. Conductor stringing would occur at designated pull and tensioning sites. Large reels of conductor would be transported to the staging areas or pulling sites on flatbed trucks.

Petroleum Pipeline

The pipeline relocation process would take place within an easement and would require trenching down to about 8 feet, with bottom width of 3 feet, top width of 15 feet. Once in place and tested, the trench would be backfilled with native soils, and the construction easement restored to its original condition. Oil pipeline marker posts would be installed to facilitate future pipeline locations.

2.4.8 Construction Equipment and Crew

The installation of the proposed facilities would require, but is not limited to, the following equipment: earth movers, excavators, backhoes, front-end loaders, bulldozers, pavement saws, dump trucks, diesel generator, water tanks, water trucks, flat-bed trucks, drill rigs, compactors, double transfer trucks for soil hauling, concrete trucks, dewatering equipment and paving equipment. Following are descriptions of typical construction operations for the component of the proposed project, as well as a summary of estimated construction equipment and duration of use for each component. All construction information is based on preliminary facility concepts, and if construction methods change materially supplemental environmental review would be conducted.

Reservoir Facilities

Based on the expected dimensions of the main dam and saddle dams, it is estimated that construction of the dam embankments would proceed at a rate of 20,000 cubic yards/day. This assumes that four crews each working at a production rate of 3,000 cubic yards/day per shift could place up to 12,000 cubic yards during each 10-hour day shift, and 8,000 cubic yards could be placed during each 10-hour nighttime shift.

Excavation of soil on site to for use in constructing the dam is estimated to proceed at rate of 4,000 cubic yards per day. Foundation drilling and grouting is estimated to proceed at 1,200 square yards per month.

Construction equipment and estimated duration for construction of the reservoir facilities is summarized in **Table 2-1**. These estimates are combined summaries of construction equipment and durations for the various stages of the reservoir construction including site preparation, embankments, saddle dams, inlet/outlet works, spillway, and site restoration. These estimates assume two 10-hour shifts per day, five days per week during active construction, and construction materials such as steel, concrete formwork and ready-mix concrete would be hauled to the site from offsite sources.

Table 2-1: Summary of Construction Equipment and Duration for Reservoir Facilities

Equipment	Equip Hours	Equip Days*	Trips**
Grader	478	24	N/A
Hydraulic excavators (CAT375 or equivalent)	3,126	156	N/A
Hydraulic excavator (CAT 5130B or equivalent)	848	42	N/A
Backhoe loader	696	35	N/A
Push-pull scraper	60,084	3,004	N/A
Water truck, 13,000 gallons	32,002	1,600	N/A
Dump truck	3,556	178	45,021
Soil compactor	26,312	1,316	N/A
Track loader	630	32	N/A
Bulldozer	26,380	1,319	N/A
Concrete truck	6,984	349	5,655
Dump Truck	3,134	157	862
Flatbed truck	6,315	363	1,251
Pickup truck	2,664	133	264
Transfer dump truck and trailer	23,946	1,197	23,696
Vacuum truck, 5,000 gallons	396	20	N/A
Worker vehicles	24,409		20,341
Assumes a 60-mile roundtrip at 50 mph with 1.5 occupants per vehicle			
Total:	**221,959**	**9,925**	**97,089**

*All equipment is assumed to be utilized twenty (20) hours per day.

**Trips do not apply to equipment operating within a distinct area.

Conveyance Facilities

Pipelines

Open-cut construction is expected to occur in agricultural land including unpaved farm roads. Installation of dewatering wells may be required prior to start of excavation depending on the soil type and groundwater level. Water pumped from the excavation area must be properly disposed to nearby irrigation ditches or impoundments in accordance with relevant permitting requirements. Dewatering pumps would run continuously (24 hours per day) in the open trench areas while excavation is taking place, to maintain the groundwater level below the bottom of trench. After the pipeline is installed and backfilled, the dewatering pumps would be removed and relocated to the next segment of pipeline construction. Heavy equipment for excavation would typically involve continuous use of an excavator which would sidecast excavated soil along the pipeline alignment. That material would be reused to backfill the pipeline trench. Excess material would be off hauled in dump trucks to the reservoir construction area where it can be used for embankment construction. Dump trucks hauling material from off-site sources for pipeline bedding and backfill would make semi-continuous trips to the site as pipe is being installed. An excavator or crane would be used to lift pipe segments from a flat-bed delivery truck and position the pipe in the trench. Temporary trench plates would be installed over the trench at the end of each workday. Final trench cover and marking typically would be done for the entire pipeline length after installation.

Trenchless pipe installation is described in *Section 2.4.6*, above and typically would involve use of ground tunneling machine for 10 hours per day with associated mud collection pumps running simultaneously. It is assumed that two crews of up to 10 workers would be installing the pipelines and tunnels at any one time. **Table 2-2** shows construction equipment and duration estimates for the pipeline.

Conveyance facilities would generate spoil associated with construction of tunnels and open-cut construction of pipelines. Approximately 66 percent of the pipelines would be constructed using open cut methods. Assuming an average of 100 feet of open cut pipeline would be constructed per day (roughly 80 days of construction), a maximum of 24,500 cubic yards of excess material would be generated. This is equivalent to 2,450 truck trips (10 cubic yards per haul) or 41 trip truck trips per day (round trip). If the soils can be used for bedding, the spoil would be reduced to about 8,550 cubic yards and 1,855 truck trips total.

For tunnel construction, a production rate of 10 linear feet per day is assumed and a tunnel diameter of 9 feet for a total of 145 days of construction. Each day would generate 30 cubic yards of excess material or 3 truck trips per day.

Table 2-2: Equipment and Duration for Construction of Pipeline

Equipment Type	Estimated Number Used (per day)	Estimated Duration (within a day)	Open Cut Trenching–Estimated Total Number of Working Days of Use During Entire Construction	Tunneling–Estimated Total Number of Working Days of Use During Entire Construction
Open Cut Trench				
Excavator	2	10	60	-
Bulldozer	1	4	60	-
Dewatering pumps	1	24	60	-
Off-road dump trucks	1	10	60	-
Highway legal dump truck	14	10	50	-
Front end loader	2	10	60	-
Flatbed truck	8	10	15	-
Pickup trucks	3	5	300	-
Worker vehicles	8	2	300	--
Crane	1	6	40	-
Tunneling				-
Tunnel boring machine	1	10	90	270
Dewatering pumps	1	24	90	270
Off-road dump trucks	1	10	90	180
Highway legal dump truck	7	10	130	770
Pickup trucks	2	5	140	840
Worker vehicles	7	2	140	840
Front end loader	1	8	90	550
Crane	1	6	130	430

Pumping Plant

Table 2-3 presents earthwork estimate to construct the pumping plant. These estimates are based on preliminary structural sizing and site layouts of buildings, mechanical and electrical facilities, with the following additional assumptions:

- Pipelines and buried vaults are installed with about 5 feet of cover over the top of the pipe;
- Structural excavations would extend 2 feet beneath slabs and major structures to allow for placement of 2 feet of compacted foundation material fill (crushed rock, e.g. Caltrans Class 2 Aggregate Base);
- Below grade structures are excavated within at least 2 feet of final exterior walls;
- The pumps would be installed in individual pump bays in a large wet well; and
- Existing soils are suitable for backfill of pipe trenches above the pipe embedment zone and for backfill of below grade concrete structures.

Table 2-3: Earthwork to Construct Pumping Plant

Earthwork Component	Volume (cubic yards)
Cut	15,000
Fill	9,700
Native Fill[1]	3,200
Import Fill[2]	6,500
Net Off Haul to Spoil	5,300

1. Imported fill is assumed to include pipe bedding and pipe zone backfill, structural foundation subgrade fill and road base material. Structure backfill around walls is assumed to be processed native material.
2. Native fill is assumed to include pipe trench zone backfill, structure backfill behind below grade walls and embankment fills. Native fill reused on site is assumed to be stockpiled onsite until used; no off-site truck traffic is required for hauling.

Based on the volumes of import material and off haul shown in **Table 2-3**, it is estimated that 1,200 highway truck trips may be required for hauling import and off-hauled material (round trip). Spoil areas are likely to be developed within the reservoir inundation area, shortening the haul for spoiling. Import material trips would be from commercial quarries.

The total volume of concrete to be placed at the site is estimated to be 900 to 1,000 cubic yards. This concrete would be sourced from and mixed at an off-site commercial concrete plant or a portable concrete plant established for the dam facility construction and delivered to the site in 8 cubic yards concrete transit mixers trucks as structures are constructed. Approximately 125 concrete truck trips would be required (round trip). Concrete would need to be placed first and then cured between 7 to 28 days prior to stripping formwork. Larger structures would be placed in multiple pours with suitable construction joints.

Other materials and equipment would be delivered to the site over the course of construction. Typically, equipment and materials are delivered on large flatbed trucks or truck-mounted shipping containers and stockpiled or stored on-site until installed. It is estimated that a project of this size would require up to 50 round-trip trucked deliveries of material and equipment. Construction equipment and estimated duration for construction of the pumping plant is summarized in **Table 2-4**. These estimates are based on an assumed construction process of 2-3 years.

Table 2-4: Equipment and Duration for Construction of Pumping Plant

Equipment	Estimated Number Used (per day)	Estimated Duration within a Day (Hours total when used for work item)	Estimated Total Number of Working Days of Use During Entire Construction
Excavator	2	6	100
Bulldozers	2	6	30
Off-road dump trucks	6	6	25
Highway legal dump trucks	8	6	30
Front end loader	2	5	30
Backhoe	2	2	30
Vibrating roller	4	6	30
Grader	2	6	30
Asphalt paving machine	1	6	15
5-ton crane	1	6	200
2-ton crane	1	6	80

Road Relocation

Table 2-5 identifies ranges of earthwork expected for construction. The majority of fill is expected to be obtained on site. The excavation and placement of embankment materials would follow the procedures described in Section 19 of the Caltrans Standard Specifications.

Table 2-5: Earthwork (cubic yards) to Construct Roadway

Excavation	Fill	Net
1,780,000 – 2,670,000	1,750,000 – 2,630,000	22,000 – 33,000 (cut)

Equipment that would be used to build the roadway is summarized in **Table 2-6.** These estimates are based on the length of road, volume of earthwork, standard construction practices and road design requirements. This information assumes a contractor would be able to operate multiple pieces of equipment at several locations along the alignment at the same time.

Table 2-6: Equipment and Duration for Construction of Roadway

Equipment Type	Estimated Number Used (per day)	Estimated Duration within a Day (Hours total when used for work item)	Estimated Total Number of Working Days of Use During Entire Construction
Excavator	8	10	180
Bulldozers	8	10	200
Off-road dump trucks	8	10	180
Scrapers	4	10	180
Highway legal dump truck	8	10	100
Front end loader	4	5	180
Backhoe	2	2	200
30 Ton crane	1	5	10
Concrete truck	10	8	30
Vibrating roller	4	10	40
Grader	2	10	15
Asphalt paving machine	1	10	18

It is estimated that 1,400 off-site truck trips using highway approved dump trucks would be required to obtain and place the crushed rock. Crushed rock would come from Caltrans approved quarries with the specific quarry selected by the Construction Contractor. A similar amount of asphalt concrete pavement (ACP) would be required for both alternatives. Approximately 30,000 tons of ACP would be required for either alternative. Placing ACP would require approximately 18 days.

Because this is a new roadway alignment, construction would progress relatively quickly because the contractor would not be constrained with maintaining open lanes of traffic as is required for projects that add a lane to an existing highway. Construction is expected to take up to 24 months and is expected to proceed in one continuous phase.

Utilities Relocation

Power Lines

Construction equipment and estimated duration required for the relocation of the power transmission lines is summarized in **Table 2-7.** Relocation would require more work than raising the towers, so relocation is assumed for purposes of evaluating impacts associated with construction activities. This assumes up to 47 steel towers and 30 wooden poles would be constructed for the five existing transmission lines to be relocated, with individual equipment crews moving sequentially to the next tower site when a specific work task is completed for a total construction period of approximately 30 months.

Table 2-7: Equipment and Duration for Relocation of Transmission Lines

Equipment Type	Estimated Number Used (per day, per tower site)	Estimated Duration within a Day (Hours total when used for work item)	Estimated Total Number of Working Days of Use During Construction (per tower site)
Grader (site preparation and site restoration)	4	10	4
Bulldozer	2	10	4
Auger drill rig	2 for lattice, one for poles	8	4
Concrete truck	2 for lattice, one for poles	10	4
Cranes	5	8	1
Helicopter	1 to fly in tower; 10 for conductoring	8	2
Manlifts	3	10	6
Flatbed trucks for material deliveries (3-axel truck)	4	8	1
Highway legal dump truck	2	10	2
Pullers and tensioners	2	10	4
Pick-up trucks for workers	10	4	20

Petroleum Pipeline

Relocation of the petroleum pipeline would be expected to take about four months, after the approximate 2-month period for manufacturing the new pipeline. Construction equipment and estimated duration required for the relocation is summarized in **Table 2-8**.

Table 2-8: Equipment and Duration for Relocation of Petroleum Pipeline

Equipment Type	Estimated Number Used	Duration
Excavator	2	4 months
Bulldozer for easement preparation	2	1 week
Front end loader	2	4 months
Pipe side booms	6	4 months
Welding trucks	6	2 months
Pick-up trucks for workers	8	4 months
Sheep’s foot roller compactor	2	2 months
Paving machine	1	3 days
Double transfer trailer rigs	3 delivery loads per day	3 days
Flatbed trucks for pipe delivery	250 loads	1 week

2.4.9 Construction-Related Water Requirements

Water from water trucks would be used during construction activities for dust control purposes. Water generated from the trench dewatering operations may also be usable for dust control.

2.4.10 Environmental Commitments

During construction the contractors would follow standard construction best management practices including preparing and following a Stormwater Pollution Prevention Plan (SWPPP) and preparing and following a Hazardous Materials Plan. The SWPPP would list best management practices (BMPs) that would be used to protect storm water runoff; a visual monitoring program; and a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs. BMPs to be implemented as part of the SWPPP would include, but are not limited to use of temporary erosion control measures, such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover for disturbed areas; and reestablishment of grass or other vegetative cover on unpaved areas of the construction site as soon as possible after disturbance.

During construction contractors for all project components shall be required to employ fire prevention measures. Contractors shall ensure that staging areas, welding areas, or areas slated for construction be cleared of dried vegetation or other materials that could ignite. Construction equipment that includes a spark arrestor shall be maintained in good working order. In addition, construction crews shall have a spotter during welding activities to look out for potentially dangerous situations, such as accidental sparks. Other construction equipment shall be kept in good working order and used only within cleared construction zones. During construction, constructors shall require vehicles and crews working at the project site to have access to functional fire extinguishers, and water trucks shall be present during all grading activities.

Mitigation measures are described in *Chapter 3, /Environmental Setting, Impacts and Mitigation Measures*, and address potentially significant impacts for each resource area. As required by CEQA, the Project Partners will adopt a Mitigation Monitoring and Reporting Program (MMRP), which would specify the mechanisms by which implementation of mitigation measures would be ensured during construction and operation of the Del Puerto Canyon Reservoir project. The MMRP would specify the environmental commitments that would be adopted as conditions of project approval.

2.5 References

AECOM 2016. Del Puerto Canyon Reservoir Phase 1 Feasibility Assessment, March 9, 2016

Marineau, M.D., S.A. Wright, D.R. Whealdon-Haught, and P.J. Kinzel. 2017. Physical characteristics of the lower San Joaquin River, California, in relation to white sturgeon spawning habitat, 2011–14. U.S. Geological Survey Scientific Investigation Report 2017–5069.

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Chapter 3 Environmental Setting, Impacts and Mitigation

3.0 Introduction to Environmental Analysis

3.0.1 Impacts Not Found to be Significant

An Initial Study was prepared to determine which environmental resources required detailed evaluation in the Draft EIR (see Appendix A). Based on the evaluation of impacts in the Initial Study, it was determined that the Project would not have significant impacts on: Mineral Resources, Noise, Population and Housing, Public Services, and Wildfire Risk. A detailed discussion of these resources has been excluded from this Draft EIR. Although the Initial Study did not identify significant impacts to recreation, based on public input during scoping an evaluation of Recreation impacts is included in *Section 3.12, Land Use and Recreation.*

3.0.2 Organization of Chapter 3

Chapter 3 includes evaluations of each environmental resource areas as follows:

- 3.1 Aesthetics
- 3.2 Agriculture and Forestry Resources
- 3.3 Air Quality
- 3.4 Biological Resources – Terrestrial
- 3.5 Biological Resources - Fisheries
- 3.6 Cultural Resources
- 3.7 Energy Resources
- 3.8 Geology and Soils
- 3.9 Greenhouse Gas Emissions
- 3.10 Hazards and Hazardous Materials
- 3.11 Hydrology and Water Quality
- 3.12 Land Use and Recreation
- 3.13 Traffic and Transportation
- 3.14 Tribal Cultural Resources
- 3.15 Utilities and Service Systems
- 3.16 Environmental Justice
- 3.17 Indian Trust Assets

3.0.3 Analysis of Cumulative Impacts

CEQA Requirements

CEQA requires consideration of cumulative impacts. A cumulative impact is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. Cumulative impacts, as defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the Project when added to other closely related past, present, or reasonably foreseeable future projects. Pertinent guidance for cumulative impact analysis is provided in Section 15130 of the CEQA Guidelines, and included below:

- An EIR shall discuss cumulative impacts of a project when the project's incremental effect is "cumulatively considerable" (i.e., the incremental effects of an individual project are considerable when viewed in connection with effects of past, current, and probable future projects, including those outside the control of the agency, if necessary).
- An EIR should not discuss impacts that do not result in part from the project evaluated in the EIR.
- The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not be as detailed as it is for the effects attributable to the project alone.
- A project's contribution is less than cumulatively considerable, and thus not significant, if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.
- The focus of analysis should be on the cumulative impact to which the identified other projects contribute, rather than on attributes of the other projects that do not contribute to the cumulative impact.

The cumulative impact analysis for each individual resource topic is described at the end of each resource section in this Chapter except for the GHG section, in which the entire analysis is inherently cumulative.

Approach to Cumulative Analysis

For evaluation of cumulative impacts, this EIR uses a specific project list-based approach, rather than a summary of projections from adopted plans, and evaluates the potential for past, present and probable future projects in the project area to result in cumulative impacts. **Table 3.0-1** contains a list of projects under consideration in the project area and identifies those projects that have a potential nexus with the DPCR (i.e., there is a possibility that the proposed project could contribute to incremental effects on the same environmental resources). The list of projects in **Table 3.0-1** was developed using information provided by the Project Partners, City of Patterson, Stanislaus County, U.S. Bureau of Reclamation and Western Area Power Administration.

Table 3.0-1: List of Cumulative Projects for Del Puerto Canyon Reservoir Project

Doc Type	Date	Status	Description/Location	Impact Nexus?
			DPWD and Exchange Contractors Projects	
Cat Ex	2019	Pilot Project underway	**Orestimba Creek Groundwater Recharge & Recovery Project**: Pilot project is operating, environmental review for ultimate project could occur in 2020.	N
NA	2019	Ongoing	Various **exchange agreements**: Exchange Contractors have various agreements for water transfers, including an agreement to provide Level 4 refuge water supplies.	N
			City of Patterson Projects	
EIR	2012	Approved	**West Patterson Business Park Expansion Project**: 1,119-acre development with light industrial, business park, and general commercial uses; located west of Rogers Road, east of Interstate 5, south of Zacharias Road and north of Sperry Avenue.	Limited
IS/MND	6/20/19	Undergoing CEQA review	**Grainger Distribution Center expansion**: 179,780-square-foot expansion to existing building in West Patterson Business Park.	N

Doc Type	Date	Status	Description/Location	Impact Nexus?
EIR	12/20/18	NOP issued	**Zacharias Master Plan**: Annexation of 1,295.6-acre area south of Zacharias Road and east of Rogers Road; Master Plan includes residential, mixed use, commercial, industrial, school, park and open space uses. .	N
Development Agreement	2007	Approved, under construction	**Villages of Patterson**: Phased development of up to 3,100 residential units and associated amenities west of State Route 33. Several residential projects underway.	N
Development Agreement	2007	Approved, being constructed in phases	**Westridge Business Park**: 121-acre business park on northwest corner of Sperry Avenue and Baldwin Road with ongoing projects being developed. Amazon Fulfillment Center is already operating and additional commercial and industrial business park uses are in process.	N
Conditional Use Permit	2019	Approved	**Palms Plaza**: 12-acre shopping center on southwest corner of Sperry Avenue and Baldwin Road.	N
Development Agreement	2013	Approved, not yet built	**Patterson Logistics Center**: 70-acre light industrial development north of Sperry Avenue east of DMC.	N
Master Plan	2018	Preliminary planning	**City of Patterson Water Master Plan**: Evaluated 13 water supply options, including a stormwater capture project to recharge 1,700 AF of water from Del Puerto Creek.	Y
			Stanislaus County Projects	
EIR	12/4/18	Approved	**Crows Landing Industrial Business Park Project**: Specific Plan and zoning change for 1,532-acre project site south of West Marshall Road.	N
			StanCOG Project	
TBD	2016	Feasibility Study	**South County Corridor Study**: Potential route connecting State Route 99 and Interstate 5. Study considers connections at Fink Road, Sperry Avenue and Zacharias Road; the latter would require a new interchange at Zacharias Road and I-5. The study identifies the Fink Road connection as the preferred option.	N
			Western Area Power Administration Project	
EIR/EIS	2016	In design; Construction start 2021.	**San Luis Transmission Project**: New high voltage transmission line adjacent to existing transmission line corridor.	Y

Projects identified above as having no impact nexus with the DPCR are not considered in the cumulative analysis because they are not expected to have impacts that could combine with the project. This determination is based on one or both of the factors below:

- Projects are located outside of the area where the proposed project would be constructed and could thus not have impacts that would combine with effects of the proposed project.
- Project is of a type that would not produce impacts that could combine with impacts of the DPCR.

Groundwater banking projects, including the Orestimba Creek Groundwater Recharge & Recovery project could benefit groundwater resources and would not be expected to affect the San Joaquin River or have construction impacts similar to the proposed project. The projects could have a cumulative effect on the capacity of the DMC, which would be managed by Reclamation through operation of the DMC and would not be expected to result in environmental impacts. Ongoing exchange agreements would be subject to existing operational rules and are not expected to result in environmental impacts that would combine with the DPCR to result in cumulative impacts.

The City of Patterson has approved a number of residential, commercial, retail and light industrial development projects that are in the process of being developed. The largest project, Villages of Patterson, is east of SR33 and will have no impact nexus with the DPCR. The majority remainder of projects are east of Rogers Road and south of Zacharias Road, but are sufficiently distant from areas where DPCR facilities would be constructed that they are not expected to result in an impact nexus with the DPCR. Only the West Patterson Business Park Expansion Project is in proximity to the DPCR facilities. Operational impacts, primarily traffic, would be of a type that are generally not expected to combine with effects of the DPCR to result in cumulative impacts**.** There is one resource area where the West Patterson Business Park has the potential to combine with the proposed project to result in a cumulative impact: potential disruption of wildlife migration for species that use the corridor formed by I-5, the California Aqueduct and DMC. The West Patterson Business Park would develop all of the corridor east of I-5, while the proposed project has the potential to interrupt the corridor west of I-5. See the discussion of cumulative biological resources impacts in *Section 3.4*.

The West Patterson Business Park and Expansion Project is expected to be developed in multiple phases over 20 to 30 years. While development proposals in the first Phase could occur during the timeframe proposed for construction of the DPCR, the first phases are located in the southern portion of the site and the later phases that would include development along Zacharias Road, closer to the DPCR, are not projected to be developed until 2023 at the earliest. Because the timing would not overlap, although the northern area is adjacent to DPCR facilities, the development of the northern area of the business park is not expected to result in cumulative construction-related impacts. Similar to other City of Patterson development projects, operational impacts would be of a type that are not expected to combine with effects of the DPCR to result in cumulative impacts**.**

The City of Patterson Water Master Plan (City of Patterson 2018) identifies a stormwater capture project using uncontrolled flows from Del Puerto Creek. Because the DPCR could impact flows in Del Puerto Creek and associated groundwater recharge, and the City's proposed project could be operating at the same time as the DPCR, there is a potential for cumulative effects on groundwater recharge due to reduced flows in Del Puerto Creek

The Crows Landing Industrial Business Park Project area is bounded by West Marshall Road on the north, Fink Road to the south, Bell Road to the east, and Davis Road to the west, and is thus outside the DPCR project area.

StanCoG is considering a roadway project that could overlap with the DPCR conveyance alignments. The South County Corridor Study is considering an alignment that would connect with Interstate 5 at a new interchange at Zacharias Road, which is within the area under consideration for conveyance from the reservoir to the DMC. However, the project has not been funded and the alternative alignment has not been selected. If the alignment that includes a new interchange at Zacharias Road is selected, construction would likely not occur until 2029 or later, so construction of the reservoir and associated facilities would not overlap with interchange construction. Design of the DPCR pipeline would be coordinated with any future transportation projects, and operation of the underground pipeline would not combine with the interchange to result in cumulative impacts.

The proposed San Luis Transmission Project crosses directly through the proposed reservoir inundation area, and the proposed project would require relocation of the proposed alignment. This relocation is addressed in this EIR as a consequence of the DPCR, and therefore would not contribute to cumulative impacts together with the DPCR.

3.1 Aesthetics

This section evaluates the potential aesthetic impacts associated with implementation of the proposed project. Aesthetic resources are defined as the visible natural and built landscape features that surround a project site. For the purpose of this analysis, the project area includes aesthetic resources in the vicinity of the facilities to be constructed or modified under the proposed project.

3.1.1 Environmental Setting

The discussion below defines the terms used in the aesthetics evaluation and describes the visual conditions of the region and project area.

Definitions

Visual character, visual quality, and visual sensitivity are three terms used throughout this section. Visual character is the unique set of landscape features that combines to make a view, including native landforms, water, and vegetation patterns as well as built features such as buildings, roads, and other structures. Visual quality is the intrinsic appeal of a landscape or scene due to the combination of natural and built features in the landscape. Natural and built features combine to form unique perspectives with varying degrees of visual quality, which is rated in this analysis as high, moderate, or low. Visual sensitivity reflects the level of interest or concern that viewers and responsible land management agencies have for a particular visual resource with visual quality taken into account. Visual sensitivity is a measure of how noticeable proposed changes might be in a particular setting and is determined based on the distance from a viewer, the contrast of the proposed changes, and the duration that a particular view would be available to viewers. For example, areas such as scenic vistas, parks, trails, and scenic roadways typically have a high visual quality and visual sensitivity because these locales are publicly protected, appear natural, view durations are typically long, and close-up views are more commonly available.

Regional Setting and Project Vicinity

The project area is located within Stanislaus County, which is located in California’s Central Valley. The County is characterized by the valley floor stretching east from the Interstate 5 corridor and mountainous and hilly terrain west of the Interstate 5 corridor. Visually this creates sweeping views to the east of agricultural lands, with occasional development in the form of small towns and industrial land uses. To the west, the Diablo Range rises above the valley floor, and the hills within the project area are primarily grazing land and undeveloped hillsides. The project area is generally located in the central portion of Stanislaus County to the west of the City of Patterson. Views of the area where proposed project facilities would be constructed are generally available along the Interstate 5 corridor adjacent to Del Puerto Canyon, and within Del Puerto Canyon itself. The terrain of the project area is generally flat in the eastern end of the project area along the DMC transitioning into the foothills of the Diablo Range rising west of Interstate 5. The Diablo Range is visible from the valley floor from a distance; however, long-range visibility in the area is frequently limited by haze and particulate air quality contamination. The Diablo Range in the project area is generally characterized by rolling grasslands and foothills, to the west of Interstate 5, while views to the east of Interstate 5 generally include agricultural operations and light industrial buildings. Agricultural land is planted predominantly with orchard and row crops, which can impede views from local roadways. While views of the reservoir footprint are generally undeveloped and agricultural land, there are a number of large transmission line towers within the reservoir footprint, some of which are visible from neighboring roadways, including Interstate 5 and Del Puerto Canyon Road.

Figure 3.1-1 and **Figure 3.1-2** show existing views of the project area, while **Figure 3.1-3** shows a view of Del Puerto Canyon in the proposed inundation area.

Figure 3.1-1: View of Interstate 5 from Del Puerto Creek and Proposed Base of Dam

Figure 3.1-2: View of Del Puerto Canyon from the California Aqueduct, Interstate 5 in Mid-Ground

Figure 3.1-3: Del Puerto Canyon, within Proposed Inundation Area

The stretch of Interstate 5 adjacent to the proposed project is designated a scenic highway under the California Streets and Highway Code, Division 1, Chapter 2, Article 2.5, Section 263.3(d). The scenic highway designation in the project vicinity is "Route 5[1]" from Highway 152/33, approximately 30 miles south of the proposed dam, to Highway 132, approximately 15 miles north of the proposed dam. There are two vista points along Interstate 5 in Stanislaus County: one is located just south of Shiells Road Undercrossing, approximately 14 miles south of Del Puerto Creek, and the other is approximately 0.5 mile south of Salado Creek, or approximately 5 miles south of Del Puerto Creek. Neither of these vista points is in the immediate vicinity of the project area. Close-up views of the project area are available from Interstate 5, though only briefly while driving, due to the 70 mile-per-hour speed limit on this stretch of Interstate 5.

West of Interstate 5 lies unincorporated Stanislaus County. Stanislaus County's General Plan identifies the portion of the project area in the unincorporated county as agricultural land use (County of Stanislaus, 2016b). East of Interstate 5 lies the City of Patterson. The portion of the project area within the City of Patterson is zoned as West Patterson Light Industrial (City of Patterson, 2014a). The City of Patterson's General Plan Map shows the project area west of Interstate 5 and east of Del Puerto Canyon Road as mixed use, with a small area of Highway Services Commercial immediately north of Del Puerto Creek, adjacent to Interstate 5 (City of Patterson, 2014e). Current land use is dominated by agriculture, with a few large commercial and industrial structures east of the DMC in the vicinity of the project area.

3.1.2 Regulatory Framework

This section describes laws and regulations related to aesthetics that may apply to the project.

[1] California Streets and Highway Code refers to Interstate 5 as Route 5.

Federal Policies and Regulations

No federal policies and regulations relevant to aesthetic resources apply to the proposed project.

State Policies and Regulations

California Scenic Highway Program

In 1963, the state legislature established the California Scenic Highway Program, a provision of the Streets and Highways Code, to preserve and enhance the natural beauty of California (Caltrans 2014). The State Highway System includes designated scenic highways and those that are eligible for designation as scenic highways. Section 261 of the Streets and Highways Code requires:

> *The standards for official scenic highways shall also require that local governmental agencies have taken such action as may be necessary to protect the scenic appearance of the scenic corridor, the band of land generally adjacent to the highway right-of-way, including, but not limited to, (1) regulation of land use and intensity (density) of development; (2) detailed land and site planning; (3) control of outdoor advertising; (4) careful attention to and control of earthmoving and landscaping; and (5) the design and appearance of structures and equipment.*

Portions of Interstate 5 are officially designated as a state scenic highway, including from State Route 152 in Merced County, south of the project area, to State Route 205 in San Joaquin County, north of the project area. The entire length of Interstate 5 that lies within Stanislaus County is therefore a state scenic highway.

Local Policies and Regulations

Stanislaus County

General Plan

The Conservation Element of the General Plan (2016a) includes the following goals and policies relevant to aesthetic resources within the project area:

GOAL ONE: Encourage the protection and preservation of natural and scenic areas throughout the County.

Policy One: Maintain the natural environment in areas dedicated as parks and open spaces.

Policy Two: Assure compatibility between natural areas and development.

The Land Use Element of the Stanislaus County General Plan (2016b) includes the following goals and policies relevant to aesthetic resources within the project area:

GOAL TWO: Encourage compatibility between land uses.

Policy Sixteen: Outdoor lighting shall be designed to be compatible with other uses.

Implementation Measure 2: Outdoor lighting shall be required to provide minimum impacts to the surrounding environment and where feasible will utilize downcast cut-off type fixtures that are shielded and direct the light only towards objects requiring illumination.

None of the Community Plans within the Land Use Element of the Stanislaus County General Plan address communities within 3 miles of the project area and are therefore not relevant to the aesthetic impacts of the proposed project.

Zoning Ordinance (2017)

The project area is zoned General Agricultural (A-2). Though no zoning codes for A-2 are directly relevant to aesthetic resources and the proposed project, **Section 21.20.010** of the County's zoning code states that

> *It is the intent of these district regulations to support and enhance agriculture as the predominant land use in the unincorporated areas of the county. These district regulations are also intended to protect open-space lands pursuant to Government Code Section 65910. The procedures contained in this chapter are specifically established to ensure that all land uses are compatible with agriculture and open space, including natural resources management, outdoor recreation and enjoyment of scenic beauty*.

For all Communication Facilities, the following sections of the County's zoning ordinance applies to the proposed project as related to aesthetic resources.

21.91.030 Siting Standards

B. Siting standards for communication towers

1. The tower shall be a monopole design unless the Planning Director determines that it would not be visible to the general public, in which case a lattice tower design may be approved.

2. The height of the tower shall not exceed 130 feet above ground level.

21.91.050 Aesthetic Considerations

Decisions on use permits or staff approval permits may take into consideration the aesthetic impact of the proposed microwave dish antennas and/or communications facilities and may include conditions of approval for the purpose of reducing the visual impact of the antenna and/or facility as seen from adjacent properties or for the purpose of reducing the potential of safety or health hazards. Such conditions may include, but are not limited to partitions, screening, landscaping, mountings, fencing, height of antenna, and site location within the parcel.

City of Patterson

General Plan

The City of Patterson's General Plan Land Use Element (2014b) identifies the Foothills Expansion Area as a potential area for future development. This area includes the project area for the northern saddle dam, a portion of the conveyance corridor, and the potential utility realignment corridor. Development in the Foothills Expansion Area should consider potential visual impacts as viewed from Interstate 5 and the City of Patterson, and hillside development should address grading, slope stability and visual impacts.

The City of Patterson's Community Design Element (2014c) includes the following goal and policy relevant to the proposed project and aesthetic resources:

Goal CD-5: To maintain and enhance the visual quality of the foothills.

Policy CD-5.1 Hillside development. Development on the hillsides shall:

a. Keep a low profile and conform to the natural slopes;

b. Avoid large, continuous walls or roof surfaces, or prominent foundation walls, poles, or columns;

c. Minimize grading of roads;

d. Minimize the grading of visible driveways;

e. Include planting which is compatible with native hillside vegetation and which provides a visual transition from developed to open areas;

f. Use materials, colors, and textures which blend with the natural landscape and avoid high contrasts;

g. Minimize exterior lighting.

The City of Patterson's Natural Resources Element (2014d) includes the following goal and policy relevant to aesthetic resources in the project area:

Goal NR-3: To protect natural open space areas, sensitive native vegetation, and wildlife communities and habitat.

> **Policy NR-3.3** On-site resource preservation. The City shall encourage new development to preserve on-site natural elements that contribute to the community's native plant and wildlife species value and to its aesthetic character.

Zoning Ordinance (2017)

The City of Patterson's zoning ordinance includes requirements for development in designated zones. Within the City's boundaries, the project area is zoned West Patterson Light Industrial. The following sections of the City's zoning ordinance are relevant to the proposed project and aesthetic resources:

18.42.040 Development standards

Building height in West Patterson Light Industrial zoned parcels is 45 feet.

18.46.050 Performance standards

B. Glare and Heat. No direct or sky-reflected glare or heat, whether from floodlights or from high temperature processes (including combustion or welding or otherwise) shall be visible or felt at the property line.

18.80.060 General lighting requirements

B. Nuisance Prevention and Shielding. All outdoor lighting shall be designed, located, installed, directed downward or toward structures, fully shielded, and maintained in order to prevent glare, light trespass, and light pollution. All outdoor lighting shall be recessed and/or constructed with full downward shielding in order to reduce light and glare impacts on trespass to adjoining properties and public rights-of-way. Each fixture shall be directed downward and away from adjoining properties and public rights-of-way, so that no light fixture directly illuminates an area outside of the project site intended to be illuminated.

C. Height. The maximum height of light poles on private property shall be:

1. Thirty-two feet for all nonresidential districts;

2. Twenty-four feet for all residential districts and within one hundred feet of a residential zoning district;

3. Exceptions to the height limits shall be considered by the planning commission for athletic fields and other unique circumstances where additional height is required.

D. Level of Illumination. Outdoor lighting shall be designed to illuminate at the minimum level necessary for safety and security and to avoid the harsh contrasts in lighting levels between the project site and adjacent properties. Illumination requirements are provided in Table 18.78.060-1 (Illumination Requirements).

E. Hours. Automatically control exterior lighting dusk to dawn to turn off or lower light levels during inactive periods.

3.1.3 Impact Analysis

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to aesthetic resources. Visual analysis is based on evaluations of aerial and ground-based photographs of the project sites, and preliminary design information.

Visual effects were assessed based on the project's potential to substantially alter scenic resources or to degrade the visual character of the site. The evaluation of temporary or short-term visual impacts considers whether construction activities could substantially degrade the existing visual character or quality of the site or surrounding area, as well as the duration over which any such changes would occur. Construction activities occurring in an area for less than one year are typically considered to have a less-than-significant effect on visual quality. However, construction activities occurring in an area for over one year have been evaluated for potentially significant temporary visual impacts.

Actions with long-term visual effects, such as constructing new or altered structures, grading roads, removing trees, and introducing new sources of light and glare can permanently alter the landscape in a manner that could affect the existing visual character or quality of the area, depending on the perspective of the viewer. In determining impact potential, the assessment considers the visual sensitivity of the project area. Since damage to scenic resources such as trees, rock outcroppings, and other features of the built or natural environment would typically constitute a long-term effect, the potential for project implementation to damage scenic resources is evaluated solely as a long-term effect and is not included in the analysis of construction-related impacts.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines,* as updated in December 2018, an impact on aesthetics would be considered significant if the project would:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- In nonurbanized areas, substantially degrade the existing visual character or quality public views of the of the site and its surroundings. Public views are those that are experienced from publicly accessible vantage points; and
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Impacts and Mitigation Measures

Impact AES-1 Substantial Damage to Scenic Resources within a State Scenic Highway and Substantial Degradation of Existing Visual Character or Quality, or a Substantial Adverse Effect on a Scenic Vista

This impact discussion addresses the first three criteria in the Appendix G checklist, including effects on a scenic vista, damage to scenic resources within a state scenic highway and degradation of visual characters or quality of public views.

Construction Impacts

The project could result in temporary construction-related impacts on scenic resources and the visual character or quality of the project area and immediate vicinity. Due to the proximity to Interstate 5, construction of the project would be visible from this scenic highway.

Reservoir

Based on geography and height of the main dam, it is expected that the main dam and spillway would be partially visible from about one-quarter mile on either side of the culvert where Del Puerto Creek crosses under Interstate 5). Construction of the three saddle dams would have limited visibility from Interstate 5. Construction activities for the dam, saddle dams, spillway, and inlet/outlet works would be visible from further away than the completed structures, due to height of some equipment and location in relation to the dam. Construction activities that may be visible and affect the visual quality of this portion of the Interstate 5 Scenic Highway include the presence of heavy equipment (excavators, backhoes, trucks, generators, tanks, drill rigs, and other equipment listed in *Section 2.4.8*). Dust from construction may obscure views temporarily, though dust control measures would be implemented (see *Section 2.4.9*), along with mandatory measures required by the San Joaquin Valley Air Pollution Control District (SJVAPCD) Rule 8011, General Requirements – Fugitive Dust Emission Sources (see *Section 3.3.2*). As dam construction progresses, views from Interstate 5 into Del Puerto Canyon would be reduced until blocked completely by the main dam.

Conveyance Facilities

Conveyance facilities construction includes pipelines, pumping plant and electrical facilities, along with access roads. Construction of the pipelines would have limited visual impact because pipelines would be installed in open trenches or through trenchless crossings, and the only visual impacts would be from construction equipment and layout of materials along the pipeline alignment. These impacts would be temporary. Construction of the pumping plant and electrical facilities would be visible from Interstate 5 and other public roadways, including staging areas, construction equipment, materials, and structures as they are erected. There may also be dust during construction that could affect visual quality in the project area, though these impacts would be minimized through implementation of construction best management practices and mandatory dust control measures required by SJVAPCD Rule 8011 (see *Section 3.3.2*). These construction activities would have temporary impacts on the visual quality of the stretch of the Scenic Highway within the project area, though only the aboveground facilities would be visible once construction is complete.

Utility Relocation

Construction activities for the utility realignment would be visible from further away than those of the dam and conveyance systems due to the height of utility poles and location along hillsides and hilltops. While construction of the utility realignment would be visible from a scenic highway (Interstate 5), the temporary nature of the work would reduce the visual impact. Construction of the new alignment for the petroleum pipeline would be visible from scenic Interstate 5 in the form of construction equipment and staging of materials. Because the petroleum pipeline alignment would be installed underground, and construction in a given location would change every few days as the pipeline is installed, visual impacts during construction would be minimal.

Staging Areas

Staging areas would be located along Interstate 5 and other access points to the site and would be visible from Interstate 5 during the duration of construction. Visible at the staging areas would be equipment, materials such as pipes, stockpiled fill materials, concrete and masonry, worker vehicles, and construction trailers. Staging areas are typically fenced in and secured to prevent unauthorized access, but are not screened, and may temporarily impact visual quality near the project area for the duration of construction.

Operation Impacts

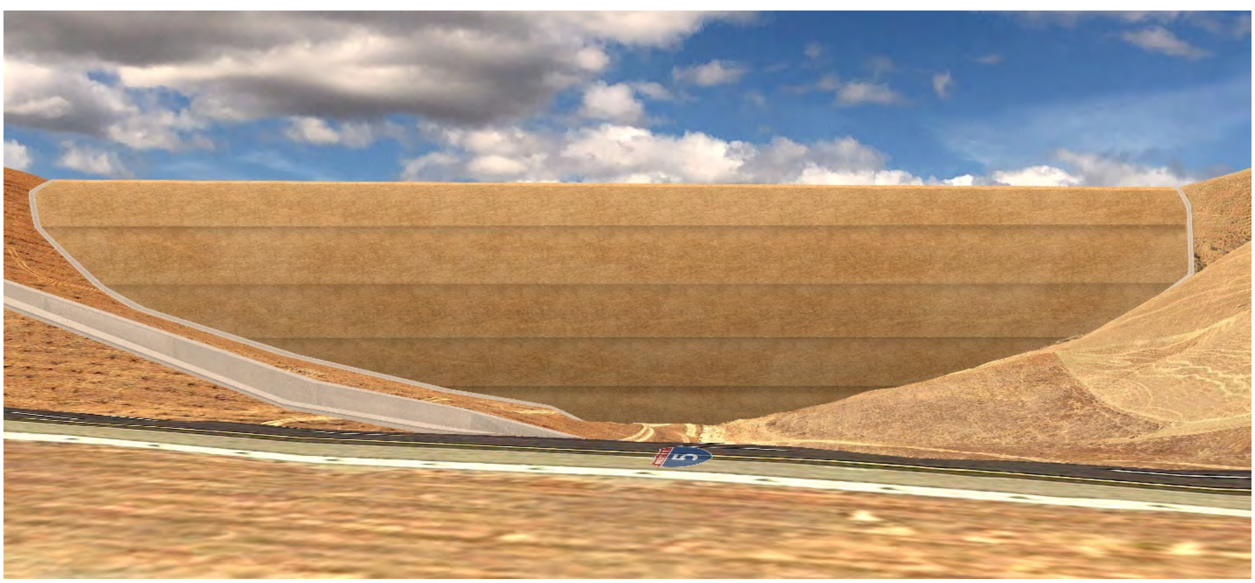
Reservoir

Once built, the main dam would be visible or partially visible for approximately half of a mile on Interstate 5, approximately one-quarter mile on either side of the culvert where Del Puerto Creek crosses

Interstate 5. As seen in **Figure 3.1-4** and **Figure 3.1-5**, the main dam would eliminate existing views of Del Puerto Canyon. While driving at 65 miles per hour, the main dam would be visible for less than one minute on Interstate 5, and substantial view impacts would only be experienced for a portion of that time, generally as vehicles pass the mouth of the canyon at Del Puerto Creek. <u>If traffic delays from existing commute traffic are experienced, it may be possible for traffic to slow or stop within the vicinity of the proposed dam, which would increase the potential length of time the dam would be visible from Interstate 5.</u> Views of the canyon from existing access roads and nearby roads, such as Zacharias Road, on the east side of the DMC and California Aqueduct would be impeded by the main dam. The main dam would not be noticeable from Highway 33. Once construction is completed, hydroseeding as part of the Stormwater Pollution Prevention Plan would result in vegetation growth on the outside of the dam, helping it to visually blend with the surrounding hillsides (see *Section 2.4.10*).

Figure 3.1-4: Existing View from Interstate 5 of Del Puerto Canyon, Looking West

Figure 3.1-5: Visual Simulation of the Main Dam, as seen from Interstate 5, Looking West



The primary saddle dam, located in the side canyon where the existing Del Puerto Canyon Road enters the main canyon, would be approximately one-half mile from Interstate 5, and would have a vegetated slope on the outside of the dam, helping to blend it visually with the surrounding hillsides. The primary saddle dam would not be visible from public roadways once the project is completed and the ~~northern~~ portion of Del Puerto Canyon Road between Diablo Grande Parkway and the reservoir is closed to vehicle ~~public~~ access. The other two saddle dams would not be visible from Interstate 5. There is potential for the smaller saddle dams to be visible from the proposed realignment of Del Puerto Canyon Road constructed as part of the proposed project. None of the three saddle dams would be visible from other roadways or public viewpoints.

As shown in **Figure 3.1-5**, the spillway would be visible from Interstate 5, a designated scenic highway. Due to the location of the spillway on the northern slope of the hillside along the southern edge of the dam, and design of the spillway as an excavated channel, it would be more visible when viewed from the north Interstate 5 (i.e., when driving southbound), than when looking from the south (i.e., when driving northbound on Interstate 5). The spillway would have limited visibility when viewing from directly across the Interstate 5 or the California Aqueduct and DMC because it would be excavated into the bedrock and have limited abovegrade structures. The spillway basin would not be visible from Interstate 5 because of its location at a lower elevation than the existing roadway.

The inlet/outlet structure in the reservoir would be completely shielded from views along Interstate 5 by the main dam and surrounding geography.

Although not located within the City of Patterson's boundaries, the inlet/outlet structure, main dam, spillway, and the primary saddle dam would be located within its sphere of influence and would be designed consistent with the City's General Plan, which requires that materials, colors, and textures for development on hillsides blend with the natural landscape and avoid high contrast (Policy CD-5.1).

The portion of the existing Del Puerto Canyon Road within the project area provides views of rolling hillsides, foothills, grazing land and agricultural operations. Construction of the reservoir would eliminate approximately 6 miles of the existing Del Puerto Canyon Road and replace it with a new route that would provide views of the reservoir off and on until rejoining the existing Del Puerto Canyon Road. The operation of the proposed project would involve the raising and lowering of water levels in the reservoir. As water levels changes, the visual quality of the canyon may also change as a result of sedimentation and erosion of canyon sides due to water movement, as well as potential changes in plant palette that could result from changing availability of water and tolerance to variable water levels. However, the reservoir would primarily be visible only from the new roadway alignment and from existing service roads in the area.

Conveyance Facilities

The conveyance pipelines from the DMC to the reservoir would be buried as they are being constructed, thus, they would not have long-term operational impacts on the visual quality and character in the project area. Aboveground features associated with conveyance facilities include the pumping plant and its associated electrical facilities and the access roadways necessary for maintenance. A concrete masonry unit (CMU) block wall would be constructed around the pumping plant site and surge tanks, with taller enclosures around other specific equipment as needed. The electrical substation would be surrounded with security fencing. The pumping plant would be located east of and visible from Interstate 5, a designated scenic highway. It would be approximately 0.6 miles away, slightly further from Interstate 5 than other large, existing structures in the vicinity of the project area, such as the Restoration Hardware building on Rogers Road. Buildings and aboveground structures associated with the pumping plant would be consistent in height with other nearby structures, with the exception of the antenna (50-feet tall) and anchor/terminal tower (40-feet tall). Both the antenna and terminal tower for the electrical substation are within the City's and County's height limit for communication facilities (County Zoning Ordinance 21.91.030 and City Zoning Ordinance 18.84.050). The City's Zoning Ordinance 18.84.080 requires that antenna be screened or disguised to reduce visual impacts and prohibits reflecting finishes or paints that are inconsistent with the visual character of the area. The aboveground structures for the pumping plant and electrical facilities would be consistent with the visual character of other structures located along and within the DMC, such as diversion structures, gates and pumps.

Roadway Relocation

The proposed project would construct a series of maintenance roads, as well as a realignment of Del Puerto Canyon Road to move it outside the inundation area of the reservoir. The access roadway for the dam and conveyance facilities, including the pumping plant and electrical substation would have a low profile, and be designed consistent with similar, existing service roads in the area. Access roads would not substantially alter the visual quality in the immediate vicinity of the proposed project. The new roadway that would be constructed to replace Del Puerto Canyon Road would not be visible from public vantage points or roadways, with the exception of Diablo Grande Parkway, where the new roadway would begin. There is an existing unpaved road in the immediate vicinity of the route of the proposed road. The new roadway would have a low profile and generally follow a path similar to this existing unpaved road. The existing Del Puerto Canyon Road would be gated and would become a private road providing access to the reservoir.

Utility Relocation

The proposed project would either raise existing towers so that the utility lines can span the reservoir or relocate five existing power lines and a petroleum pipeline to move them out of the reservoir footprint. The relocated power lines would require up to an estimated total of 47 new steel towers and 30 wooden poles, compared to the existing 12 towers and 8 poles within the reservoir footprint. If relocation is needed the new towers would be located nearer to the Interstate 5 corridor than the existing towers but would be consistent with existing views from Interstate 5, a scenic highway, and would not result in long-term degradation of the visual character of the area. The relocated petroleum pipeline would be buried and not visible once completed. As such, it would have no impact to the visual character or to existing scenic views as a result of operation of the proposed project.

Significance before Mitigation

Because the proposed project would be located adjacent to Interstate 5, which is a designated scenic highway, and would visible from the freeway both construction and operation of the proposed project would have significant impacts on views from a designated scenic highway.

Mitigation Measures

Mitigation Measure AES-1: Implement Color Palette Consistent with Existing Environment

The pumping plant’s above-grade structures shall be painted a matte color consistent with the area’s visual aesthetic, generally matte tan or light brown. Roofing for above-grade structures shall be matte as well to minimize potential glare.

Significance after Mitigation

It is not possible to reasonably screen construction work at the main dam without creating a visual impact. Although the main dam would visually blend with the surrounding hillsides as vegetation grows along the earthen slope face, it would still permanently impede views west along the canyon from a scenic highway. Operation of the dam would create permanent changes in the visual character of the inundation area in Del Puerto Canyon that could not be reasonably mitigated. As such, impacts to scenic resources would be significant and unavoidable.

Impact AES-2 New Sources of Substantial Light or Glare.

Construction Impacts

Construction of the main dam would require active construction 20 hours per day, and equipment maintenance the remaining four hours each day. As such, workers would be on site during reservoir construction for 24 hours per day. Nighttime construction for the main dam, three saddle dams, and spillway would occur, requiring construction lighting.

Conveyance facilities would not require nighttime construction except where trenchless crossing of Interstate 5 and the California Aqueduct and at the base of the main dam would occur. Tunneling could require nighttime work, in which case construction lighting would be required during construction of the pipeline under the California Aqueduct, Interstate 5 and the base of the main dam. Nighttime construction lighting for the dam, saddle dams, and spillway would be visible from nearby roadways, including Interstate 5, Zacharias Road, and Rogers Road. Existing orchards east of the DMC would provide some shielding from construction lighting when viewed from Zacharias Road and Rogers Road.

The nearest residences are 5,000 feet south and 4,800 feet north of the proposed pumping plant. One house is located 3,400 feet west of the end of the new roadway. Because the roadway would not require nighttime construction, there would be no lighting impacts from roadway construction to this residence. To minimize any temporary adverse effects on residential views during the duration of nighttime construction, implementation of **Mitigation Measure AES-2** would ensure that nighttime construction lighting is shielded and oriented downward and would reduce this impact a less-than-significant level.

Operation Impacts

Certain components of the proposed project would require permanent lighting for security purposes, including the main dam's control house, the inlet/outlet control building, the bifurcation structure at the bottom of the spillway, and the pumping plant. These lights would generally only be turned on when needed, such as during maintenance in the evening, early mornings, or night. It is not expected that lights would be on all night Some pole lights may be added for the electrical substation to allow for nighttime emergency or maintenance work as necessary but would also remain off unless activities occurred at night. Because there are few existing light sources where the new facilities would be located, any new lighting would noticeable. Distance to residences and roadways, coupled with limited duration of use, reduces the potential for the new light sources to interfere with enjoyment of nighttime views. All lighting at the pumping plant and electrical substation would be designed and installed to be consistent with the City's Zoning Code Section 18.80.060, which requires all outdoor lighted be directed downward or toward structures, shielded, and maintained to prevent glare, light trespass, and light pollution. It also requires that outdoor lighting illuminate only the minimum level necessary for security and safety, and that lighting be turned off or kept low during inactive periods from dusk to dawn. The proposed project would also be consistent with the County's General Plan Land Use Element that requires outdoor lighting be compatible with other uses and minimize impacts to the surrounding environment. Because the County's Zoning Code does not explicitly restrict outdoor lighting to minimize impacts to the environment in areas zones A-2 General Agriculture, including the project area, **Mitigation Measure AES-3** shall be required to reduce lighting impacts for the lit structures at the dam, bifurcation structure, and intake/outlet facilities.

Underground facilities, including the conveyance pipeline and relocated petroleum pipeline would not require lighting. No lighting would be installed on the main dam, saddle dams, spillway, or along the relocated road similarly, access roads for the project site would not be lighted.

<u>Significance before Mitigation</u>

Lighting impacts during construction would be significant because nighttime construction would be required for dam construction and trenchless crossings of the conveyance pipelines. Mitigation for nighttime lighting during construction shall be required.

New permanent lighting for the pumping plant, electrical substation, inlet/outlet and dam control buildings, and bifurcation structure would only be turned on as needed for nighttime activities. The pumping station and electrical substation would be constructed within the City of Patterson, and associated lighting would be consistent with the City's zoning code. Impacts of lighting at these facilities would therefore be less than significant. The main dam control house, inlet/outlet control house, and bifurcation structure would be constructed within unincorporated Stanislaus County. Because these facilities would be constructed in an area that does not currently have lighting, and may be visible from nearby public roadways, a new source of light would be created in the immediate project area. Impacts of nighttime lighting would be significant and **Mitigation Measure AES-3** shall be required.

Mitigation Measures

Mitigation Measure AES-2: Nighttime Construction Lighting

Nighttime construction lighting, shall be shielded and oriented downward to minimize effects on any nearby receptors including habitat for wildlife species. Lighting shall be directed toward active construction areas only and shall have the minimum brightness necessary to ensure worker safety.

Mitigation Measure AES-3: Directional Lighting for Dam Control Building, Inlet/Outlet Works Control Building and Bifurcation Structure in Unincorporated Stanislaus County

Nighttime lighting for the main dam's control building, the inlet/outlet control building, and bifurcation structure shall be equipped with directional shields that aim light downward and away from adjacent roadways and adjacent undeveloped areas that may provide habitat for wildlife species. In addition, the placement of lighting fixtures would be selected to concentrate light on-site to avoid spillover.

Significance after Mitigation

Lighting impacts would be less than significant with implementation of **Mitigation Measures AES-2** and **AES-3** because they would avoid direct views of lighting from nearby roadways, businesses, and residences.

Cumulative Impact Analysis

The geographic scope of the cumulative impacts on aesthetic resources encompasses the project area and surrounding areas. If the proposed project, as well as other projects listed in **Table 3.0-1**, would adversely affect the same scenic resources or views from public roads, they could result in significant cumulative impacts on scenic resources and the visual character of the area. As indicated in **Table 3.0-1**, two projects have an impact nexus to the proposed project as related to aesthetic resources:

- City of Patterson Water Master Plan
- San Luis Transmission Project

The City of Patterson's Water Master Plan (2018) evaluated potential water supply options and identified projects that would support a sustainable water supply portfolio. The Water Master Plan formed the basis for the City's Capital Improvement Program (CIP) project list. The projects included in the Water Master Plan that are near enough to the proposed project to require consideration of cumulative aesthetic impacts include two new wells, one storage tank, and a pump station near Zacharias Road and the DMC, a percolation pond at Del Puerto Creek at the base of the main dam in the proposed project, and associated pipelines that parallel the DMC, California Aqueduct, and along existing service roads. The Water Master Plan's wells, storage tank, and pump station along Zacharias Road would be constructed at buildout, after the proposed project is completed. Wells would not create visual impacts because they would have limited visibility. They would not compound visual changes to the surrounding area created by the proposed project because of their low profile and proposed location on the far side of the DMC from the pumping station and electrical substation. The storage tank and pump station would be required to comply with the City's low-visual-contrast standards and would be located far enough from the proposed project to avoid creating a cumulatively significant aesthetic impact when considered alongside the proposed project.

Pipelines and the spreading basins in the Water Master Plan would be constructed within five years and may overlap construction of the proposed project. With implementation of the proposed project, the spreading basins may be relocated away from the proposed project, which would avoid potential cumulative aesthetic impacts of the spreading basin and the proposed project. Should the spreading basins be constructed near Del Puerto Creek and Interstate 5 as proposed in the Water Master Plan, they would not be visible from Interstate 5 due to the elevation change between the roadway and location of the spreading basins. Therefore, while the proposed project would have significant visual impacts, these impacts would not be greater as a result of visual impacts from the spreading basins and would not be cumulatively significant. Pipelines constructed as part of the Water Master Plan would be buried, and therefore would not contribute to cumulative visual and aesthetic impacts with the proposed project.

The San Luis Transmission Project would install new high voltage transmission lines along the existing transmission corridor. However, the proposed project would require the relocation of this proposed transmission line and would include the transmission lines in the immediate vicinity of the proposed project. As such, potential cumulative visual impacts of the San Luis Transmission Project and the proposed project have been considered in the analysis of the proposed project

Significance Determination

Cumulative aesthetic impacts of the proposed project and the two identified projects in this analysis would be less than significant due to the timing of construction, location of the cumulative projects, and type of facilities to be installed. Further, the transmission line project's cumulative impacts have been incorporated into the proposed project's impact analysis and have been addressed above.

Mitigation Measures

No additional mitigation measures are needed to address cumulative impacts.

3.1.4 References

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3.2 Agriculture and Forestry Resources

This section evaluates the project's potential impacts on agricultural resources. No forestry resources exist in the project area and so impacts on these resources have not been evaluated.

3.2.1 Environmental Setting/Affected Environment

The study area for this analysis includes the project area where facilities would be constructed and the adjacent areas that could be affected by project operation and construction. The project area is entirely located in Stanislaus County in California's Central Valley. While all construction would take place in Stanislaus County, the proposed project would benefit agricultural areas in the Project Partners service areas, which include parts of San Joaquin, Stanislaus, Merced, Madera, and Fresno counties. Information is provided below on the agricultural resources of the area that would be affected by the proposed project.

Regional Setting

As described in *Chapter 1, Introduction*, DPWD provides agricultural irrigation water to approximately 45,000 acres of productive farmland in Stanislaus, San Joaquin, and Merced counties. DPWD's primary source of water is from a contract with Reclamation which provides for the delivery of up to 140,210 acre-feet of CVP water annually. DPWD's CVP water allocations have been substantially reduced since the 1990s due to Sacramento-San Joaquin River Delta pumping restrictions resulting from the passage of the Central Valley Project Improvement Act, water rights decisions, the need to meet Delta water quality objectives, the biological opinions for protection of salmon and smelt, and drought conditions. In 2014 and 2015, DPWD received no CVP water at all, and it is expected that restrictions in CVP operations will result in DPWD receiving no more than an average of 35 percent of its contractual allocation on an annual basis under non-drought conditions. The Exchange Contractors serve 255,500 acres of farmland in Stanislaus, Merced, Fresno, and Madera counties. The Exchange Contractors have a contractual water allotment to receive 840,000 acre-feet of surface water each year. In critically dry years the allocation is reduced to 75 percent, or 650,000 acre-feet.

Crops and Production

Stanislaus County

Stanislaus County consistently ranks among the top ten agricultural counties in the state. Agriculture is the County's leading industry, generating billions of dollars annually ($3.6 billion in 2017) (Stanislaus County 2016, Stanislaus County Agricultural Commissioner's Office 2017). As shown in **Table 3.2-1**, a wide range of agricultural commodities are produced in Stanislaus County. Almonds and milk are the two biggest commodities by total value produced in the County. **Table 3.2-2** shows the top 10 commodities in Stanislaus County for 2017.

Table 3.2-1: Stanislaus County 2017 Agricultural Production by Commodity Category

Category	Harvest Acreage	Total Value
Apiary Products	N/A	$80,706,000
Field Crops	681,366	$207,574,000
Fruit and Nut Crops	250,757	$1,392,747,000
Livestock and Poultry	N/A	$582,477,000
Livestock and Poultry Products	N/A	$715,117,000
Nursery Products	2,884	$271,049,000
Organic Products	8,577	$199,409,000
Other Agriculture	779	$19,793,000
Vegetable Crops	28,630	$179,320,000
Total	**972,993**	**$3,648,192,000**

Source: Stanislaus County Agricultural Commissioner's Office 2017.

Table 3.2-2: Stanislaus County Top 10 Agricultural Commodities in 2017

Commodity	Rank	Value
Almonds, All	1	$1,056,184,000
Milk, All	2	$663,650,000
Chickens, All	3	$254,695,000
Cattle and Calves, All	4	$232,962,000
Nursery Fruit & Nut Trees & Vines	5	$226,748,000
Walnuts	6	$163,644,000
Silage, All	7	$134,103,000
Turkeys, All	8	$84,096,000
Pollination, Almond	9	$67,683,000
Peaches, all	10	$52,198,000

Source: Stanislaus County Agricultural Commissioner's Office 2017.

Merced County

Like Stanislaus County, Merced County is a major agricultural county in California. In 2017, the total value of agricultural commodities produced in Merced County was approximately $3.4 billion (Merced County Department of Agriculture 2017). Agriculture is Merced County's number one industry and largest employer (Merced County 2013). **Table 3.2-3** shows agricultural production and harvest acreage in Merced County for 2017 by commodity category. In terms of specific commodities, milk and almonds were the top two commodities by total value produced in Merced County in 2017 (see **Table 3.2-4**).

Table 3.2-3: Merced County 2017 Agricultural Production by Commodity Category

Category	Harvest Acreage	Total Value
Apiary Products	N/A	$38,169,000
Field Crops	912,801	$383,335,000
Fruit and Nut Crops	143,401	$755,884,000
Livestock and Poultry	N/A	$665,101,000
Livestock and Poultry Products	N/A	$1,098,422,000
Nursery Products	1,305	$57,648,000
Other Agriculture	N/A	$15,320,000
Seed Crops	6,970	$4,504,000
Vegetable Crops	56,502	$390,502,000
Total	**1,120,979**	**$3,408,885,000**

Source: Merced County Department of Agriculture 2017.

Table 3.2-4: Merced County Top 10 Agricultural Commodities in 2017

Commodity	Rank	Value
Milk (includes Market & Manufacturing)	1	$1,026,270,000
Almonds (Kernel Basis)	2	$596,075,000
Chickens (incl. Fryers and Other Chickens)	3	$374,934,000
Cattle and Calves	4	$235,487,000
Sweet Potatoes	5	$200,016,000
Tomatoes (includes market and Processing Tomatoes)	6	$118,435,000
Hay (Alfalfa)	7	$115,056,000
Silage (Corn)	8	$92,877,000
Eggs, Chicken (Market)	9	$69,798,000
All Nursery Products	10	$57,648,000

Source: Merced County Department of Agriculture 2017.

San Joaquin County

Like Stanislaus and Merced counties, San Joaquin County has a robust agricultural industry. San Joaquin County leads the state in the production of walnuts, safflower, grain corn and watermelons (San Joaquin County Agricultural Commissioner's Office 2017). In 2017, the total value of agricultural products from San Joaquin County was $2.5 billion (San Joaquin County Agricultural Commissioner's Office 2017). **Table 3.2-5** shows agricultural production in San Joaquin County in 2017 by commodity category and total agricultural production and harvest acreage. In terms of specific commodities, grapes and milk were the top two agricultural commodities produced in San Joaquin County in 2017, followed by almonds, walnuts, cherries and cattle (see **Table 3.2-6**).

Table 3.2-5: San Joaquin County 2017 Agricultural Production by Commodity Category

Category	Harvest Acreage	Total Value
Apiary Products	N/A	$26,546,000
Field Crops	392,000	$208,839,000
Fruit and Nut Crops	271,000	$1,362,531,000
Livestock and Poultry	N/A	$122,270,000
Livestock and Poultry Products	N/A	$429,910,000
Nursery Products	N/A	$117,294,000
Seed Crops	2,490	$4,671,000
Vegetable Crops	47,400	$255,928,000
Total	**712,890**	**$2,527,989,000**

Source: San Joaquin County Agricultural Commissioner's Office 2017.

Table 3.2-6: San Joaquin County Top 10 Agricultural Commodities in 2017

Commodity	Rank	Value
Grapes	1	$395,541,000
Milk	2	$387,386,000
Almonds	3	$362,721,000
Walnuts	4	$317,372,000
Cherries	5	$184,572,000
Cattle and Calves	6	$104,208,000
Tomatoes	7	$78,812,000
Potatoes	8	$63,089,000
Hay (All)	9	$59,304,000
Silage (Other)	10	$51,406,000

Source: San Joaquin County Agricultural Commissioner's Office 2017.

Fresno County

Agriculture is also a significant component of the economy in Fresno County. In 2017, the total value of all agricultural commodities produced in Fresno County was $7.0 billion, as shown in **Table 3.2-7** (Fresno County Agricultural Commissioner's Office 2017). The largest commodity category was fruit and nut crops, which accounted for $4.0 billion. Almonds and grapes were the top two individual commodities in Fresno County for 2017. Other key commodities include poultry, pistachios, and milk (see **Table 3.2-8**).

Table 3.2-7: Fresno County 2017 Agricultural Production by Commodity Category

Category	Harvest Acreage	Total Value
Apiary Products	N/A	$95,584,000
Field Crops	1,097,542	$323,047,000
Fruit and Nut Crops	619,694	$4,033,301,000
Livestock and Poultry	N/A	$1,007,996,000
Livestock and Poultry Products	N/A	$505,849,000
Nursery Products	381	$38,247,000
Seed Crops	9,520	$27,765,000
Vegetable Crops	184,686	$990,326,000
Industrial Crops	N/A	$4,735,200
Total	**1,911,823**	**$7,026,850,200**

Source: Fresno County Agricultural Commissioner's Office 2017.

Table 3.2-8: Fresno County Top 10 Agricultural Commodities in 2017

Commodity	Rank	Value
Almonds	1	$1,220,082,000
Grapes	2	$951,231,000
Poultry	3	$605,610,000
Pistachios	4	$517,043,000
Milk	5	$441,214,000
Mandarins	6	$427,934,000
Cattle & Calves	7	$423,819,000
Tomatoes	8	$295,092,000
Peaches	9	$211,639,000
Oranges	10	$203,505,000

Source: Fresno County Agricultural Commissioner's Office 2017.

Madera County

Agriculture is also an important part of Madera County's economy, with a variety of crops grown in the county. Madera County leads the state in fig production and is also a top producer of raisin grapes and pistachios (Madera County Farm Bureau n.d.). The commodity category with the highest value in 2017 was fruit and nut crops, with a total value of roughly $1.3 billion (Madera County Department of Agriculture 2017). The total value of agricultural products in 2017 for Madera County was nearly $2.0 billion, as shown in **Table 3.2-9** (Madera County Department of Agriculture 2017). Almonds and milk were the top two agricultural commodities in Madera County in 2017 (see **Table 3.2-10**). Other top commodities included grapes, pistachios, and cattle.

Table 3.2-9: Madera County 2017 Agricultural Production by Commodity Category

Category	Harvest Acreage	Total Value
Apiary Products	N/A	$56,145,000
Field Crops	453,360	$65,573,000
Fruit and Nut Crops	252,990	$1,333,383,000
Forest Products	N/A	$1,154,000
Livestock and Poultry	N/A	$122,935,000
Livestock and Poultry Products	N/A	$316,555,000
Nursery Products	350	$29,382,000
Vegetable Crops	10,700	$48,322,000
Total	**717,400**	**$1,973,449,000**

Source: Madera County Department of Agriculture 2017.

Table 3.2-10: Madera County Top 10 Agricultural Commodities in 2017

Commodity	Rank	Value
Almonds, Nuts & Hulls	1	$723,518,000
Milk	2	$306,228,000
Grapes	3	$291,971,000
Pistachios	4	$194,971,000
Cattle & Calves	5	$63,176,000
Pollination	6	$54,795,000
Replacement Heifers	7	$35,500,000
Nursery Stock	8	$29,382,000
Tomatoes, Fresh & Process	9	$29,035,000
Poultry	10	$24,259,000

Source: Madera County Department of Agriculture 2017.

Types of Farmland

The definitions of the various types of farmland discussed below are provided in *Section 3.2.2, Regulatory Framework, State Policies and Regulations, Farmland Mapping and Monitoring Program*. According to the Farmland Mapping and Monitoring Program, Stanislaus County consists of approximately 25 percent *prime* farmland, 3 percent farmland of statewide importance, 12 percent unique farmland, and 3 percent farmland of local importance as summarized below in **Table 3.2-11**. The county also contains grazing land, which is not considered important farmland. Grazing land covers almost 42 percent of Stanislaus County.

Table 3.2-11: Countywide Farmland Mapping and Monitoring Program Land Use Designations for Stanislaus County

Land Use Category	Acres	Percent of Land Use
Important Farmland Types		
Prime Farmland	249,964	25.8%
Farmland of Statewide Importance	33,172	3.4%
Unique Farmland	116,212	12.0%
Farmland of Local Importance	26,028	2.7%
Other Land Use Designations		
Grazing Land	404,404	41.7%
Urban and Built-Up Land	66,230	6.8%
Nonagricultural and Natural Vegetation	35,134	3.6%
Rural Residential Land	10,699	1.1%
Confined Animal Agriculture	11,400	1.2%
Semi-Agricultural and Rural Commercial Land	3,575	0.37%
Vacant or Disturbed Land	5,873	0.61%
Water	7,480	0.77%
Total	**970,172**	

Source: California Department of Conservation 2016b.

Important Farmland

A definition of important farmland is included in *Section 3.2.2, Regulatory Framework, Farmland Mapping and Monitoring Program*. Much of the project area is classified by the California Department of Conservation (CDOC) as grazing land, which is not considered important farmland. As shown in **Figure 3.2-1** portions of the project area west of I-5 are classified as unique farmland and prime farmland (CDOC 2017). Based on review of historical aerial photographs available on Google Earth, the area west of I-5 was first planted with orchards in approximately late 2008 to early 2009, but the existing trees are now dead. Prior to 2010 there was no important farmland designated within the dam and reservoir footprint (CDOC 2008). Historically (i.e., prior to the planting of the now-dead orchards), the only agricultural activity in the area west of I-5 was grazing. The portion of the project area between the California Aqueduct and DMC includes prime farmland, farmland of statewide importance, and unique farmland (CDOC 2017). Both living and dead orchards exist in this area. Based on the definitions of important farmland, areas that are no longer being used for irrigated agricultural production would not qualify as important farmland four years after irrigation of the parcel ceased.

Williamson Act Contracts

According to the Williamson Act 2016 Status Report, approximately 576,000 acres were enrolled under the Williamson Act in Stanislaus County as of 2015 (CDOC 2016a). As shown in **Figure 3.2-2**, Williamson Act contract lands exist within much of the project area. Numerous parcels in the vicinity of the reservoir are enrolled in the Williamson Act and are categorized as nonprime agricultural land. Other Williamson Act parcels in the project area are in nonrenewal; these parcels lie along either side of I-5.

The parcels of land of affected by each proposed project facility are summarized by their farmland classification and Williamson Act contract status in **Table 3.2-12**.

Figure 3.2-1: Important Farmland Types

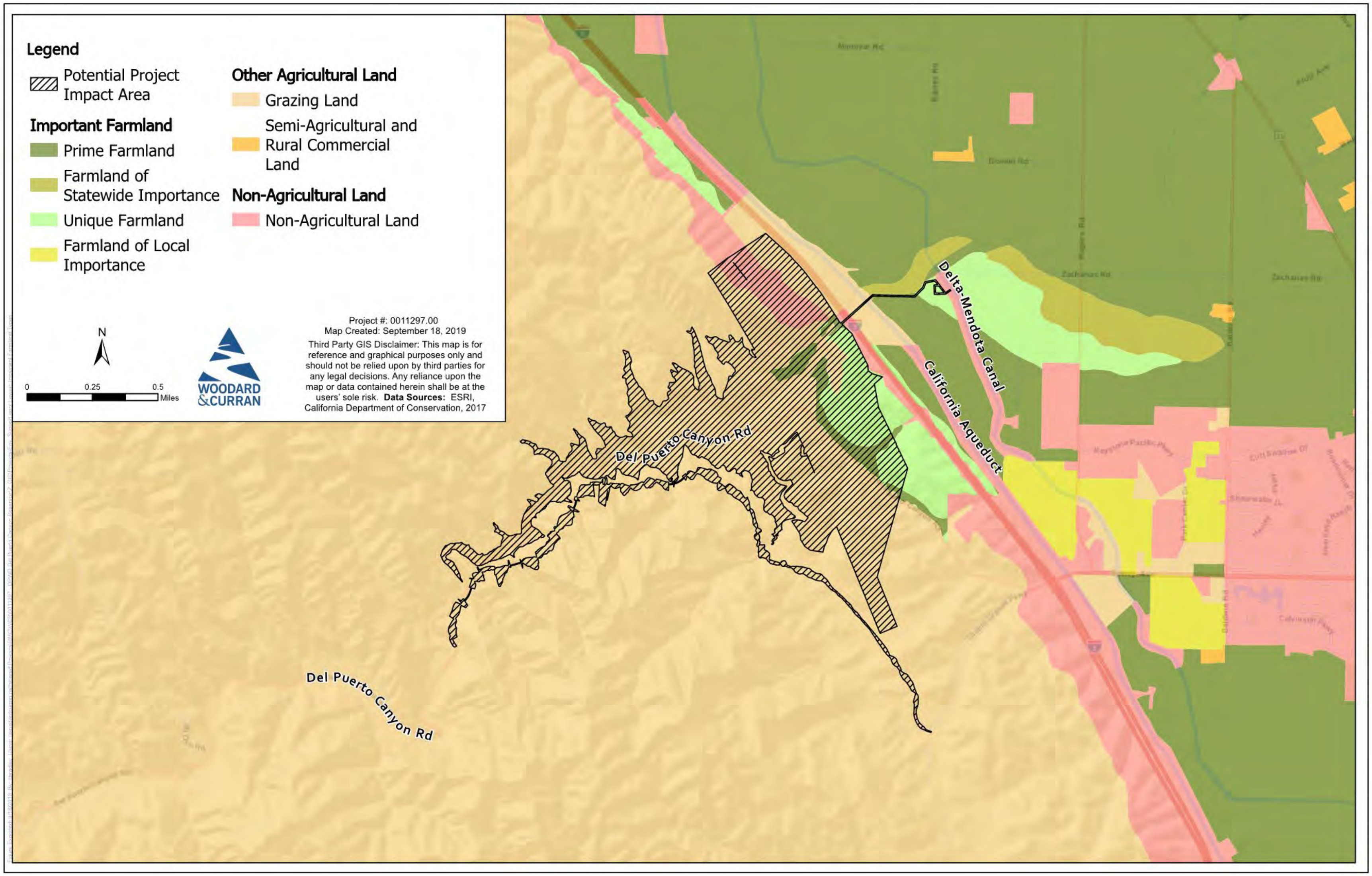

Figure 3.2-2: Williamson Act Lands

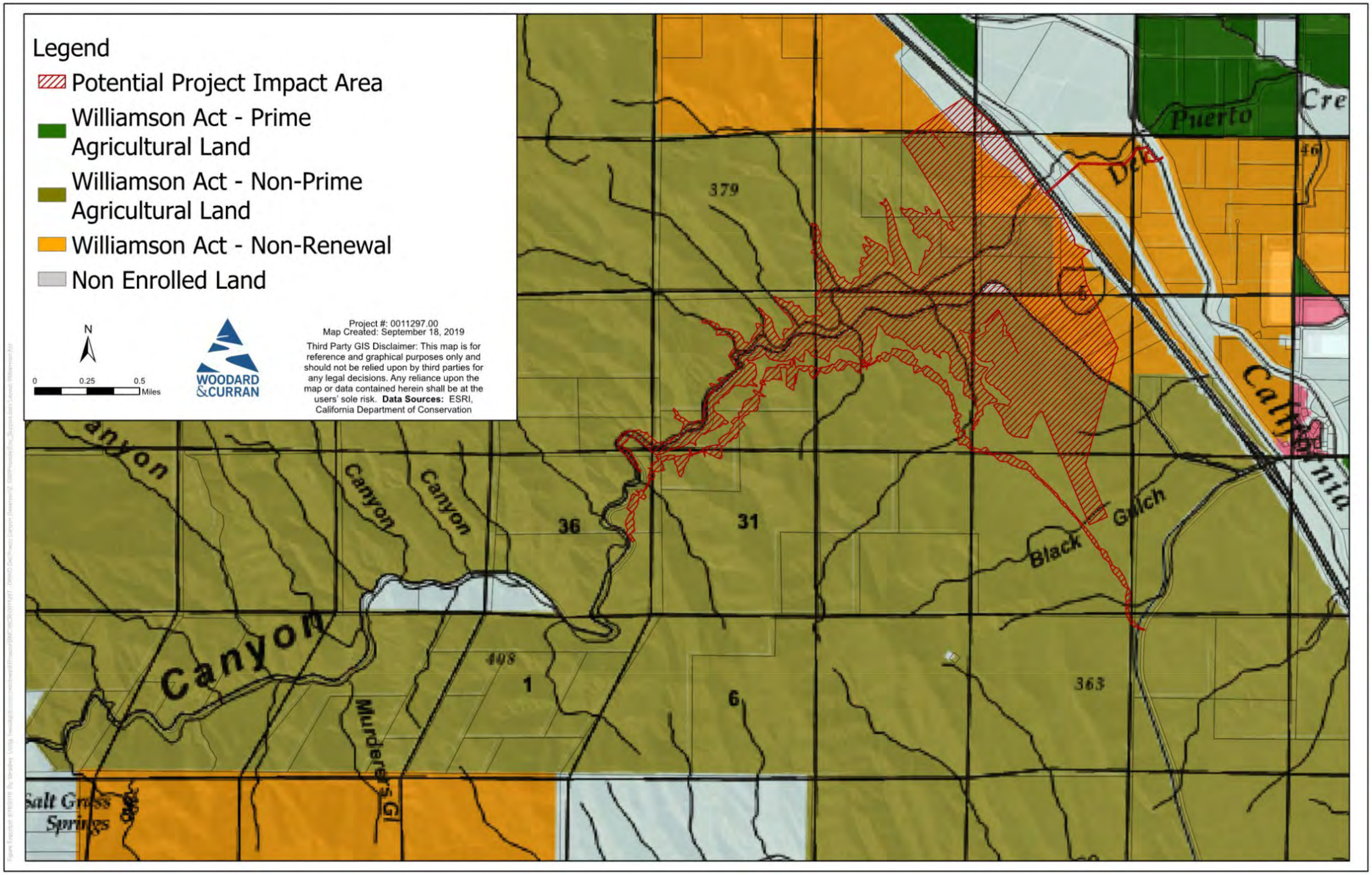

Table 3.2-12: Summary of Agricultural Land Use Classification by Project Facility

Project Component	Farmland Classification(s)	Parcels in Williamson Act Contract?
Reservoir	Prime Farmland Unique Farmland	Yes
Conveyance Facilities	Prime Farmland Farmland of Statewide Importance Unique Farmland	Yes
Roadway Relocation	N/A	Yes
Utility Relocation	Prime Farmland Unique Farmland	Yes

3.2.2 Regulatory Framework

This section describes laws and regulations at the federal, state, and local level that may apply to the proposed project.

Federal Policies and Regulations

Farmland Protection Policy Act

The Farmland Protection Policy Act requires federal agencies to (a) evaluate the adverse effects of their programs on the preservation of farmland; (b) consider alternative actions that could lessen adverse effects, and (c) ensure that their programs are compatible with state and local programs and policies for the protection of farmland. Farmland is defined as prime or unique farmlands as determined by the appropriate state or local agency. Federal agencies are required to develop and review their policies and procedures to implement the act every two years (USDA 2014).

State Policies and Regulations

Farmland Mapping and Monitoring Program

The Farmland Mapping and Monitoring Program, administered by the California Department of Conservation, produces maps and statistical data for use in analyzing impacts on California's agricultural resources (CDOC 2019a). The program rates agricultural land according to soil quality and irrigation status and publishes important farmland maps. Important farmland maps are updated every two years using a computer mapping system, aerial imagery, public review, and field reconnaissance (CDOC 2019a). Important farmland categories are as follows (CDOC 2019b):

- **Prime Farmland:** Farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. These lands have the soil quality, growing season, and moisture supply needed to produce sustained high yields. Prime farmland must have been used for irrigated agricultural production at some time during the four years before the mapping date.
- **Farmland of Statewide Importance**: Farmland similar to prime farmland, but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Farmland of statewide importance must have been used for irrigated agricultural production at some time during the 4 years before the mapping date.
- **Unique Farmland:** Farmland of lesser quality soils used for the production of the state's leading agricultural crops. These lands usually are irrigated but may include non-irrigated orchards or vineyards as found in some climatic zones. Unique farmland must have been cropped at some time during the 4 years before the mapping date.

- **Farmland of Local Importance:** Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.

California Land Conservation Act of 1965 (Williamson Act)

The California Land Conservation Act of 1965 (commonly referred to as the Williamson Act) allows local governments to enter into contracts with private landowners for the purpose of preventing conversion of agricultural land to non-agricultural uses (CDOC 2019c). In exchange for restricting their property to agricultural or related open space use, landowners receive property tax assessments that are substantially lower than the market rate (tax assessments are based upon farming and open space uses as opposed to full market value).

A Williamson Act contract may be terminated either through nonrenewal (preferred method) or cancellation (CDOC 2019d). To terminate a Williamson Act contract, a landowner may file a notice of nonrenewal. Beginning on the next contract anniversary date, the contract winds down over the remaining (usually nine-year) term with the landowner's property taxes gradually increasing until they reach the full unrestricted rate at the end of the nonrenewal period (CDOC 2019d).

Local Policies and Regulations

Physical facilities for the proposed project would be located in Stanislaus County. Policies for Stanislaus County are presented below.

Stanislaus County General Plan

The Stanislaus County General Plan (Stanislaus County 2016) regulates land use and development in unincorporated areas of Stanislaus County and outlines goals and policies to guide zoning and land use decisions. The Stanislaus County General Plan Agricultural Element contains the following goals, objectives and policies related to agricultural resources and the proposed project:

GOAL ONE: Strengthen the agricultural sector of our economy.

Objective 1.2: Support the development of agriculture-related uses

> **Policy 1.7:** Concentrations of commercial and industrial uses, even if related to surrounding agricultural activities, are detrimental to the primary use of the land for agriculture and shall not be allowed.

Objective 1.3: Minimizing agricultural conflicts

> **Policy 1.10:** The County shall protect agricultural operations from conflicts with non-agricultural uses by requiring buffers between proposed non-agricultural uses and adjacent agricultural operations.

GOAL TWO: Conserve our agricultural lands for agricultural uses.

Objective 2.1: Continued participation in the Williamson Act

> **Policy 2.1:** The County shall continue to provide property tax relief to agricultural landowners by participating in the Williamson Act.

> **Policy 2.3:** The County shall ensure all lands enrolled in the Williamson Act are devoted to agricultural and compatible uses supportive of the long-term conservation of agricultural land.

Objective 2.2: Discourage urbanization and the conversion of agricultural land in unincorporated areas of the County.

> **Policy 2.5:** To the greatest extent possible, development shall be directed away from the County's most productive agricultural areas.

Policy 2.6: Agricultural lands restricted to agricultural use shall not be assessed to pay for infrastructure needed to accommodate urban development.

Objective 2.4: Assessing and mitigating impacts of farmland conversion.

Policy 2.14: When the County determines that the proposed conversion of agricultural land to non-agricultural uses could have a significant effect on the environment, the County shall fully evaluate on a project-specific basis the direct and indirect effects, as well as the cumulative effects of the conversion.

GOAL THREE: Protect the natural resources that sustain our agricultural industry.

Objective 3.2: Water resources

Policy 3.4: The County shall encourage the conservation of water for both agricultural and urban uses.

Policy 3.5: The County will continue to protect the quality of water necessary for crop production and marketing.

Policy 3.6: The County will continue to protect local groundwater for agricultural, rural domestic, and urban use in Stanislaus County.

Objective 3.3: Soil resources

Policy 3.7: The County shall encourage the conservation of soil resources.

Additionally, the following policies in the Conservation/Open Space Element of the Stanislaus County General Plan would apply to the proposed project:

GOAL FOUR: Provide for the open-space recreational needs of the residents of the County.

Policy Ten: Discourage the division of land which forces the premature cessation of agricultural uses.

Stanislaus County Zoning Code

The Stanislaus County zoning code dictates land use in unincorporated areas of Stanislaus County and describes allowable uses in designated zoning districts. According to the Stanislaus County zoning districts map, all the unincorporated land within the project area is assigned to the *General Agriculture District* (A-2) (Stanislaus County 2014).

As described in the county's zoning code, the intent of the general agriculture district is to "support and enhance agriculture as the predominant land use in the unincorporated areas of the county" (Stanislaus County 2017). The zoning code also includes specific guidance regarding Williamson Act contract lands. Per section 21.20.045 of the Stanislaus County code, uses that may be approved on Williamson Act contract lands shall be consistent with all of the following principles of compatibility:

- The use will not significantly compromise the long-term productive agricultural capability of the subject contracted parcel or parcels or on other contracted lands in the A-2 zoning district.
- The use will not significantly displace or impair current or reasonably foreseeable agricultural operations on the subject contracted parcel or parcels or on other contracted lands in the A-2 zoning district. Uses that significantly displace agricultural operations on the subject contracted parcel or parcels may be deemed compatible if they relate directly to the production of commercial agricultural products on the subject contracted parcel or parcels or neighboring lands, including activities such as harvesting, processing, or shipping.
- The use will not result in the significant removal of adjacent contracted land from agricultural or open-space use. (Stanislaus County 2017)

Additionally, section 21.20.045 of the zoning code states that “the erection, construction, alteration, or maintenance of gas, electric, water, communication facilities” are uses compatible with the Williamson Act and may be approved on contracted land.

City of Patterson Zoning Code and General Plan

The City of Patterson zoning code establishes zoning districts that determine allowable land uses for areas within the city boundaries. The portion of the city that is within the project area is designated for light industrial use; no areas within the city are designated for agricultural use (City of Patterson 2014a). The area of overlap between the city and the project area is currently planted with abandoned orchards but is planned to be developed as a business park that will house light industrial, and general commercial uses and associated infrastructure (City of Patterson 2014b). See *Section 3.12, Land Use and Recreation,* **Figure 3.12-2** for a map displaying the City of Patterson zoning.

The City of Patterson General Plan Map also designates land uses for areas adjacent to the city, both within the city’s sphere of influence and within its general plan area, which extends outside the sphere of influence. In the areas where the general plan area overlaps with the project area, the city has identified light industrial, highway service commercial, and mixed-use areas (City of Patterson 2014a). The city does not identify agricultural land uses within the project area.

3.2.3 Impact Analysis/Environmental Consequences

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts on agriculture resources. It considers the extent to which the proposed project could result in conversion of farmland to non-agricultural uses, either temporarily or permanently. In general, temporary or not cumulatively considerable impacts would not be considered significant. This section also considers the proposed project’s consistency with existing zoning in the locations where facilities would be modified or constructed.

Impacts on forestry are not evaluated because no forestry resources exist within the project area.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines,* as updated in December 2018, an agricultural impact could be considered significant if the project would:

- 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
- Conflict with existing zoning for agricultural use, or a Williamson Act contract

Criteria Requiring No Further Evaluation

The Initial Study determined that the project would not have significant impacts associated with the following criteria:

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

Impacts and Mitigation Measures

Impact AG-1 Convert Farmland to Non-Agricultural Use

Reservoir

The reservoir and dams would be constructed in part on land designated as important farmland. Beginning during construction, land would be converted from agricultural use as the dams are built. Construction work would occur within the dam and reservoir footprints; staging areas would also be located within the dam and reservoir footprints. No impacts on agricultural land would occur outside these footprints. Once complete, the dam sites would be permanently converted away from agricultural use. Following construction, the reservoir would be filled, and the inundation area would be permanently converted to non-agricultural use.

The inundation area and dam area of the reservoir includes approximately 75 acres that are currently designated as important farmland, specifically prime farmland and unique farmland. No crops are currently produced on this important farmland; it is planted with orchards, but these are abandoned. The proposed project would convert these areas to non-agricultural use. No impacts on agricultural production would occur, because the existing orchards are dead.

The City of Patterson General Plan identifies land uses for the city's general plan area (see *Section 3.12, Land Use and Recreation,* **Figure 3.12-2**). Nearly all of the important farmland that would be affected by the reservoir and dams is included in the city's General Plan map (roughly 73 acres out of a total of 75 acres). The city designates these areas as mixed use. This indicates that the area is already a candidate for potential development and the important farmland is expected to be converted from agriculture to urban use in the future. Excluding the important farmland that is already designated for development, the proposed project would affect 2 acres that are currently designated important farmland; and this designation could be removed if irrigated agricultural production does not resume before the next biennial update of CDOC important farmland mapping.

Although the proposed project would result in a permanent loss of important farmland, it would benefit agricultural lands in Stanislaus County and elsewhere. The proposed project would improve water supply reliability for the 45,000 acres served by DPWD and the 255,000 acres served by the Exchange Contractors. In some dry years and extended droughts, water supply to these productive agricultural areas has been insufficient to meet demand. Without water, farmers may fallow lands or convert them away from agriculture permanently. This represents an economic loss to these agricultural areas and increases the potential for land to be converted to non-agricultural uses. By improving the reliability of the water supply, the proposed project would reduce the potential for land conversion throughout the Project Partners' service areas. Therefore, the proposed project would overall provide a benefit to agriculture. The loss of approximately 2 acres of important farmland that is not currently in production or capable of irrigation is less than significant.

Roadway Relocation

The roadway relocation would occur on grazing land, which is not considered important farmland. The road area is currently grazed. The grazing land would be permanently converted away from agricultural use, but there would be no conversion of important farmland. Therefore, the roadway relocation would not have a significant impact on important farmland.

Conveyance Facilities

The conveyance facilities between the reservoir and DMC would pass through prime farmland, unique farmland, and farmland of statewide importance. No agricultural activities are currently taking place on this land; orchards within the conveyance corridor are abandoned. Pipeline would be installed using open-cut trench methods. To accommodate construction equipment and work area, the entire construction corridor (active work area including the trench) would be approximately 100 feet wide. In areas where the construction corridor would be located within agricultural lands, agriculture would be temporarily precluded for some portion of the 18-month construction period of the conveyance facilities. Construction in agricultural fields may require the removal of crops, depending on the crop and time of year. Because of the temporary nature of this impact, it is considered less than significant.

The pump station associated with the conveyance facilities would be a permanent structure and, if sited on important farmland, would cause a permanent conversion away from agriculture. The pump station may be sited within the DMC right-of-way, which is not designated as important farmland. If this site were selected, the pump station would have no impact in terms of farmland conversion. Another potential pump station site is located on unique farmland adjacent to the DMC (but outside the right-of-way). No agricultural activities are currently occurring at this location; existing orchards are abandoned. This site would be within the Patterson city limits in an area zoned for light industrial use. Although the area is designated as important farmland, the city's zoning indicates that the area is planned to be converted from agricultural land to industrial use in the future. Therefore, construction of a pump station in this location would not constitute a significant impact.

Portions of the conveyance corridor would be within the Patterson city limits. The conveyance corridor would pass through areas of the city zoned for light industrial use. Portions of the conveyance corridor are outside the Patterson city limits. However, the city's General Plan map does include city zoning designations for areas outside the city limits. The map identifies the conveyance corridor outside the city limits as mixed use and light industrial land. Based on these designations, the conveyance facilities would pass through important farmland that may be slated for future development and conversion away from agriculture.

Utility Relocation

Relocation of the utilities that run north-south through the project area would involve construction in areas designated as prime farmland and unique farmland. Relocation of power lines would require grading, installation of foundations (for monopoles or lattice steel structures), and construction of an access road. The pipeline relocation process would require trenching with a top width of 15 feet. No crops are currently grown in the utility realignment corridor, so no crops would need to be removed. Any agricultural activities would be temporarily precluded from the construction areas while utilities are being relocated. Following construction, agricultural activities could be conducted over portions of the existing utility alignment (where the alignment does not overlap with the reservoir inundation area or dam footprint).

Once the utility relocation is complete, agricultural activities could be conducted on the land above the pipeline and beneath the power lines. The foundations for monopoles or lattice steel structures, and the access roads for these structures, would convert agricultural land to developed uses if sited on important farmland. The acreage of the converted area would be small because of the small footprint size of the transmission towers, and only the southern part of the realignment corridor is situated on important farmland. Although the extent of land conversion is limited, the impact of the utility relocation is considered significant.

Portions of the utility relocation corridor overlap with the City of Patterson's general plan area. The General Plan identifies areas within the utility relocation corridor as mixed use and highway service commercial, indicating that these areas have already been identified for potential future development and conversion to urban uses.

Significance before Mitigation

The City of Patterson General Plan indicates that the majority of the important farmland in the project area is expected to be developed with non-agricultural uses in the future. The loss of approximately 2 acres of important farmland that is not in production or irrigable is less than significant.

Mitigation Measures

No mitigation measures identified.

Impact AG-2 Conflict with Existing Zoning for Agricultural Use, or a Williamson Act Contract

As shown above in **Table 3.2-12**, the area of potential effect for each project component would include nonprime Williamson Act land. The entire project area is zoned for general agriculture (with the exception of the portion of the project area that falls within the Patterson city limits).

Reservoir

The proposed project would include constructing one main dam and three saddle dams. Construction impacts on agriculture would be limited to the footprints of the proposed reservoir and dams. At the end of construction, the reservoir would be filled; operation of the reservoir would not affect agricultural areas outside the reservoir and dam footprint. The reservoir component of the proposed project would permanently remove roughly 950 acres of nonprime Williamson Act land from agricultural use. Currently, the agricultural land in the reservoir footprint is used for grazing; the area also minimally includes some dead orchards.

The proposed project is consistent with the intent of the Stanislaus County's general agriculture zoning designation, which is to "support and enhance agriculture as the predominant land use in the unincorporated areas of the county… and to ensure that all land uses are compatible with agriculture" (Stanislaus County Zoning Code Section 21.20.010). The proposed project would serve water to agricultural users, including users in unincorporated areas of Stanislaus County. During periods of water shortage, agricultural land in the Project Partners' service areas may be fallowed. The proposed project would provide improved water supply reliability and reduce the potential for fallowing or land conversion. Therefore, the proposed project supports agricultural land uses in Stanislaus County.

According to the Stanislaus County zoning code, land uses compatible with Williamson Act lands shall not "significantly compromise the long-term productive agricultural capability on contracted parcels" or "displace or impair current or reasonably foreseeable agricultural operations on contracted parcels." Additionally, according to the zoning code, the "erection, construction, alteration, or maintenance of gas, electric, water, communication facilities" are uses deemed compatible with Williamson Act land. The zoning code also states that "uses that significantly displace agricultural operations on the subject contracted parcel or parcels may be deemed compatible if they relate directly to the production of commercial agricultural products on the subject contracted parcel or parcels or neighboring lands." Although the reservoir would remove Williamson Act land from agricultural use, the proposed project is consistent with the existing zoning, including Williamson Act contracts. The proposed project would consist of construction and operation of a water facility which would provide water supply to agricultural areas on neighboring lands and would therefore be consistent with the zoning code. As noted above, the proposed project would support agriculture in the Project Partners' service areas, including agriculture on land enrolled in the Williamson Act.

Roadway Relocation

The new road would be constructed on Williamson Act land that is currently used for grazing. The roadway relocation would encompass 38 acres in total. This area would be permanently converted to a roadway and no longer available for agricultural use. However, the roadway would remove only small portions of each Williamson Act parcel from agricultural use. Per the Stanislaus County Williamson Act Uniform Rules, a nonprime agricultural parcel of 40 gross acres is presumed large enough to sustain its agricultural use (Stanislaus County 2007). The realigned roadway would cross five parcels, all of which consist of nonprime land under Williamson Act contract. One of these parcels has an existing area of under 40 acres, therefore the project would not cause the gross parcel size to fall below the 40 acres specified by the County. Each of the remaining parcels would have an area of at least 40 acres of agricultural land following construction of the roadway. Therefore, the remaining portions of the parcels would still be large enough to be maintained under Williamson Act contract, and the impacts of the realigned roadway would be less than significant. As mentioned in the discussion of reservoir impacts above, the proposed project as a whole would serve water to agricultural users, thereby preserving agricultural lands in the County. The proposed project, including the road relocation, would not induce residential, commercial, or industrial development in the surrounding area; therefore, the proposed project would not cause conversion of adjacent sites to non-agricultural uses. Agriculture would remain the predominant land use in the area surrounding the proposed project.

Conveyance Facilities

The conveyance corridor passes through Williamson Act lands, Williamson Act lands that are in nonrenewal, and land zoned for general agriculture that is not contracted under the Williamson Act. The zoning code states that “erection, construction, alteration, or maintenance of gas, electric, water, communication facilities” are compatible with Williamson Act lands. The construction of the project water conveyance facilities would be consistent with this provision. For the lands designated only as general agriculture (i.e., not enrolled in the Williamson Act), the zoning code notes that “facilities for public utilities” are a permissible use (section 21.20.030). Based on the zoning code, the conveyance facilities would be compatible with existing land use designations.

Utility Relocation

The utility relocation work would occur on currently contracted Williamson Act land and on Williamson Act land that is in nonrenewal. Stanislaus County zoning code states that “erection, construction, alteration, or maintenance of gas, electric, water, communication facilities” are uses deemed compatible with Williamson Act; the oil pipeline and power transmission facilities to be relocated would fall under this provision. In addition, a use is deemed compatible with Williamson Act land if the use will not: compromise the long-term productive agricultural capability on contracted parcels; displace or impair current or reasonably foreseeable agricultural operations on contracted parcels; or result in the significant removal of adjacent contracted land from agricultural or open-space use (Stanislaus County 2017). Construction of the new pipeline and power lines and their associated staging areas may temporarily preclude agricultural activity during the construction period. However, the construction activity would be temporary. Neither the construction nor the operation of the utilities would affect the long-term agricultural productivity of the parcels, displace other agricultural operations, or remove contracted land from agricultural use. Therefore, the utility relocation would be consistent with existing zoning and Williamson Act contracts.

Significance before Mitigation

The majority of the proposed project would occur on nonprime lands enrolled in the Williamson Act. The project consists of water facilities, which are an acceptable use under the Stanislaus County Zoning Code for the Williamson Act. The roadway realignment would also occur on Williamson Act land but would not reduce the size of any parcels beyond what Stanislaus County permits. Therefore, construction and operation of the proposed project is considered a compatible use relative to the Williamson Act. Under county zoning code, facilities for public utilities are considered consistent with the general agriculture designation. Therefore, construction and operation of the proposed project is also considered a compatible use relative to county zoning code. Project construction and operation would thus constitute a less-than-significant impact.

Mitigation Measures

No mitigation measures are required.

Cumulative Impact Analysis

The geographic scope of the cumulative impacts on agricultural resources encompasses the project area and surrounding areas. If the proposed project, as well as other projects listed in **Table 3.0-1**, would adversely affect the same agricultural resources, they could result in significant cumulative impacts on agricultural resources. The following projects were identified as having a potential nexus with the project:

- City of Patterson Water Master Plan: evaluated 13 water supply options, including a stormwater capture project to recharge 1,700 acre-feet of water from Del Puerto Creek.
- San Luis Transmission Project: new high voltage transmission line adjacent to existing transmission line corridor.
- Zacharias Master Plan: annexation of 1,295.6-acre area south of Zacharias Road and east of Rogers Road; Master Plan includes residential, mixed use, commercial, industrial, school, park and open space uses

The City of Patterson Water Master Plan evaluates water supply options for the city. The master plan is not related to agricultural land use or water supply and would not cause conversion of agricultural land or conflict with existing zoning or Williamson Act contracts. The San Luis Transmission Project would have no impact in terms of conflict with zoning for agricultural use or Williamson Act contracts. The project's impact on conversion of important farmlands to non-agricultural uses was deemed to be less than significant, as most transmission towers and project components could be located outside of important farmlands (Western Area Power Administration and San Luis & Delta-Mendota Water Authority 2015). The Zacharias Master Plan would annex over 1,000 acres of important farmland (including prime farmland, farmland of statewide importance, and unique farmland) to the City of Patterson. These areas would be zoned for a mix of non-agricultural uses. Implementation of the proposed project, in conjunction with the Zacharias Master Plan, would represent a cumulatively significant impact on agricultural resources.

Significance Determination

One potential cumulative project in the project vicinity (the Zacharias Master Plan) would result in a potential loss of up to 1,000 acres of important farmland if all acreage with that designation is converted to non-agricultural uses. The incremental effect of the conversion of approximately 2 acres of important farmland as a result of the proposed project, compared to the potential loss of up to 1,000 acres as a result of the Zacharias Master Plan, is not cumulatively considerable. Because the incremental impact of the proposed project on the loss of important farmland associated with the proposed project is not cumulatively considerable, the cumulative impact of the proposed project is less than significant.

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3.3 Air Quality

This section evaluates the potential air quality impacts associated with implementation of the proposed project. This analysis is based on a review and consideration of existing air quality conditions, estimation of the proposed project air pollutant emissions, and information from state and local agencies.

3.3.1 Environmental Setting

The discussion describes the existing environmental conditions within the study area, which includes the project site and the San Joaquin Valley Air Basin where the project is located.

Study Area

The project area consists of the locations where physical actions associated with the proposed project would take place, which is primarily the area where the reservoir would be located. The California Air Resources Board (CARB) has divided California into regional air basins according to topographic air drainage features. The study area is the San Joaquin Valley Air Basin, which is under jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD).

Regional Setting

The project area is in the San Joaquin Valley Air Basin, which is defined by the Sierra Nevada mountains in the east, the Coast Ranges in the west, and the Tehachapi mountains in the south. The San Joaquin Valley is flat, with a slight downward gradient to the northwest, and opens to the sea at the Carquinez Strait, where the San Joaquin-Sacramento Delta empties into San Francisco Bay.

Although marine air generally flows into the San Joaquin Valley Air Basin from the San Joaquin River Delta, the region's topographic features restrict air movement through and out of the air basin. The Coastal Range hinders wind access into the valley from the west, the Tehachapi range prevents southerly passage of airflow, and the high Sierra Nevada range is a significant barrier to the east. These topographic features result in weak airflow, which becomes blocked vertically by high barometric pressure over the valley. Consequently, the San Joaquin Valley Air Basin is highly susceptible to air pollutant accumulation over time.

Air pollutant emissions in the air basin are generated by stationary and mobile sources. Stationary sources can be divided into two major subcategories: point and area sources. Point sources occur at a specific location and are often identified by an exhaust vent or stack. Examples include boilers or combustion equipment that produce electricity or generate heat. Area sources are widely distributed and include such sources as residential and commercial water heaters, painting operations, lawn mowers, agricultural fields, landfills, and some consumer products. Mobile sources refer to emissions from motor vehicles, including tailpipe and evaporative emissions, and are classified as either on-road or off-road. On-road sources may be legally operated on roadways and highways. Off-road sources include aircraft, ships, trains, and self-propelled construction equipment. Air pollutants can also be generated by the natural environment, such as when high winds suspend fine dust particles.

Air Pollutants

Carbon Monoxide

Carbon monoxide (CO) is an odorless, colorless gas that is highly toxic. CO is formed by the incomplete combustion of fuels and is emitted directly into the air. Ambient CO concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. CO concentrations are also influenced by wind speed and atmospheric mixing. Under inversion conditions, carbon monoxide concentrations may be distributed more uniformly over an area to some distance from vehicular sources. CO binds with hemoglobin, the oxygen-carrying protein in blood, and reduces the blood's capacity for carrying oxygen to the heart, brain, and other parts of the body. At high concentrations, CO can cause heart difficulties in people with chronic diseases, can impair mental abilities, and can cause death.

Ozone

Ozone (O_3) is a reactive gas consisting of three oxygen atoms. In the stratosphere, ozone exists naturally and shields the Earth from harmful incoming ultraviolet radiation. In the troposphere (the lowest region of the atmosphere), it is a product of the photochemical process which produces a secondary pollutant, O_3, that is formed when NO_X and volatile organic compounds (VOC) react in the presence of sunlight. Ozone at the earth's surface causes numerous adverse health effects and is a major component of smog. High concentrations of ground level ozone can adversely affect the human respiratory system and aggravate cardiovascular disease and many respiratory ailments. Ozone also damages natural ecosystems such as forests and foothill communities, agricultural crops, and some man-made materials such as rubber, paint, and plastics.

Oxides of Nitrogen

Oxides of Nitrogen ($NO_{X)}$ are a family of gaseous nitrogen compounds and are precursors to the formation of ozone and particulate matter. The major component of NO_X, nitrogen dioxide (NO_2) is a reddish-brown gas that is toxic at high concentrations. NO_X results primarily from the combustion of fossil fuels under high temperature and pressure. On-road and off-road motor vehicles and fuel combustion are the major sources of NO_X.

Reactive Organic Gas

Reactive Organic Gas (ROG) is a reactive chemical gas, composed of hydrocarbon compounds that may contribute to the formation of smog by their involvement in atmospheric chemical reactions. No separate health standards exist for ROG as a group. Because some compounds that make up ROG are also toxic, like the carcinogen benzene, they are often evaluated as part of a toxic risk assessment.

Volatile Organic Compounds

Volatile organic compounds (VOC)s are hydrocarbon compounds that exist in the ambient air. VOCs contribute to the formation of smog and/or may themselves be toxic. VOC emissions are a major precursor to the formation of ozone. VOCs often have an odor, and some examples include gasoline, alcohol, and the solvents used in paints. ROG and VOCs are evaluated together in this analysis.

Particulate Matter

Also known as particle pollution, particulate matter is a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health problems. Particles that are 10 micrometers in diameter or smaller are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. Inhalable coarse particles, called PM_{10}, are typically found near roadways and dusty industries. PM_{10} particles are deposited in the thoracic region of the lungs. Fine particles, called $PM_{2.5}$, are particles less than 2.5 micrometers in diameter and are found in smoke and haze. These particles can be directly emitted from sources such as forest fires, or they can form when gases emitted from power plants, industries and automobiles react in the air. $PM_{2.5}$ particles penetrate deeply into the thoracic and alveolar regions of the lungs.

While not a criteria pollutant, fungal organisms called coccidoides can be stirred into the air by anything that disrupts soil, such as farming, construction and wind, and cause the infection known as valley fever. The fungi thrive in the soils of the San Joaquin Valley and are endemic to the arid southwest. When soil is disturbed, the fungal filaments break off and are released into the air where they can be inhaled; once in the lungs the spores reproduce, causing valley fever. The chance of infection is highest during summer months when soils are drier, and dust is more likely to be mixed into the air (MayoClinic.org 2018).

Sulfur Dioxide

Sulfur dioxide (SO_2) is a colorless, irritating gas with a rotten egg smell formed primarily by combustion of sulfur-containing fossil fuels. Suspended SO_2 particles contribute to the poor visibility that occurs in the San Joaquin Valley Air Basin. SO_2 particles can also combine with other pollutants to form $PM_{2.5}$.

Lead

Lead (Pb) is a metal that is a natural constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. The health effects of lead poisoning include loss of appetite, weakness, apathy, and miscarriage. Lead poisoning can also cause lesions of the neuromuscular system, circulatory system, brain and gastrointestinal tract.

Gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels. The use of leaded fuel has been mostly phased out, with the result that ambient concentrations of lead have dropped dramatically. Lead concentrations were last systematically measured in the San Joaquin Valley Air Basin in 1989, when the average concentrations were approximately five percent of the State lead standard; currently, lead levels remain well below applicable standards.

Hydrogen Sulfide

The State of California has established air quality standards for some pollutants not addressed by Federal standards, including hydrogen sulfide, sulfates, vinyl chloride, and visibility reducing particles. Hydrogen Sulfide (H_2S) is associated with geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations. H_2S is extremely hazardous in high concentrations and can cause death.

Sulfates

Sulfates are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to sulfur dioxide (SO_2) during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features. CARB’s sulfate standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms, and an increased risk of cardio-pulmonary disease. Sulfates are particularly effective in degrading visibility, and, due to the fact that they are usually acidic, can harm ecosystems and damage materials and property. Data collected in the San Joaquin Valley Air Basin demonstrate levels of sulfates significantly less than the health standards.

Vinyl Chloride

Vinyl chloride is a colorless gas that does not occur naturally. It is formed when other substances such as trichloroethane, trichloroethylene, and tetrachloroethylene are broken down. Vinyl chloride is used to make polyvinyl chloride (PVC) which is used to make a variety of plastic products, including pipes, wire and cable coatings, and packaging materials.

Toxic Air Contaminants

Toxic Air Contaminants (TACs) are air pollutants that may lead to serious illness or increased mortality, even when present in relatively low concentrations. Hundreds of different types of TACs exist, with varying degrees of toxicity. Many TACs are confirmed or suspected carcinogens or are known or suspected to cause birth defects or neurological damage. For some chemicals, such as carcinogens, no thresholds exist below which exposure can be considered risk-free. Examples of TAC sources in the proposed project include fossil fuel combustion sources. Sources of TACs include stationary sources, area-wide sources, and mobile sources. The California TAC list has over 700 pollutants listed.

Air Quality Attainment and Local Conditions

CARB and the federal Environmental Protection Agency (EPA) have established Ambient Air Quality Standards in an effort to protect human health and welfare. Geographic areas are deemed to be in "attainment" if these standards are met or “non-attainment” if they are not met. Nonattainment status is classified by the severity of the nonattainment problem, with marginal, moderate, serious, severe, and extreme nonattainment classifications for ozone. Nonattainment classifications for Particular Matter range from marginal to serious. **Table 3.3-1** shows the attainment status for the San Joaquin Valley Air Basin.

Table 3.3-1: San Joaquin Valley Attainment Status

Pollutant	Federal Designation/Classification	State Designation/Classification
Ozone – One hour	Revoked in 2005	Nonattainment/Severe
Ozone – Eight hour	Nonattainment/extreme	Nonattainment
PM_{10}	Attainment	Nonattainment
$PM_{2.5}$	Nonattainment/Moderate	Nonattainment
Carbon Monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Sulfur Dioxide	Attainment/Unclassified	Attainment
Lead (Particulate)	No Designation/Classification	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified
Vinyl Chloride	No Federal Standard	Attainment

Source: SJVAPCD 2015

Air Monitoring Data

The SJVAPCD, CARB, and EPA operate an extensive air monitoring network to measure progress toward attainment of the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). The closest air monitoring stations located near the project area are the Modesto 14th Street and Turlock South Minaret Street monitoring stations. **Table 3.3-2** shows the most recent three years of data available.

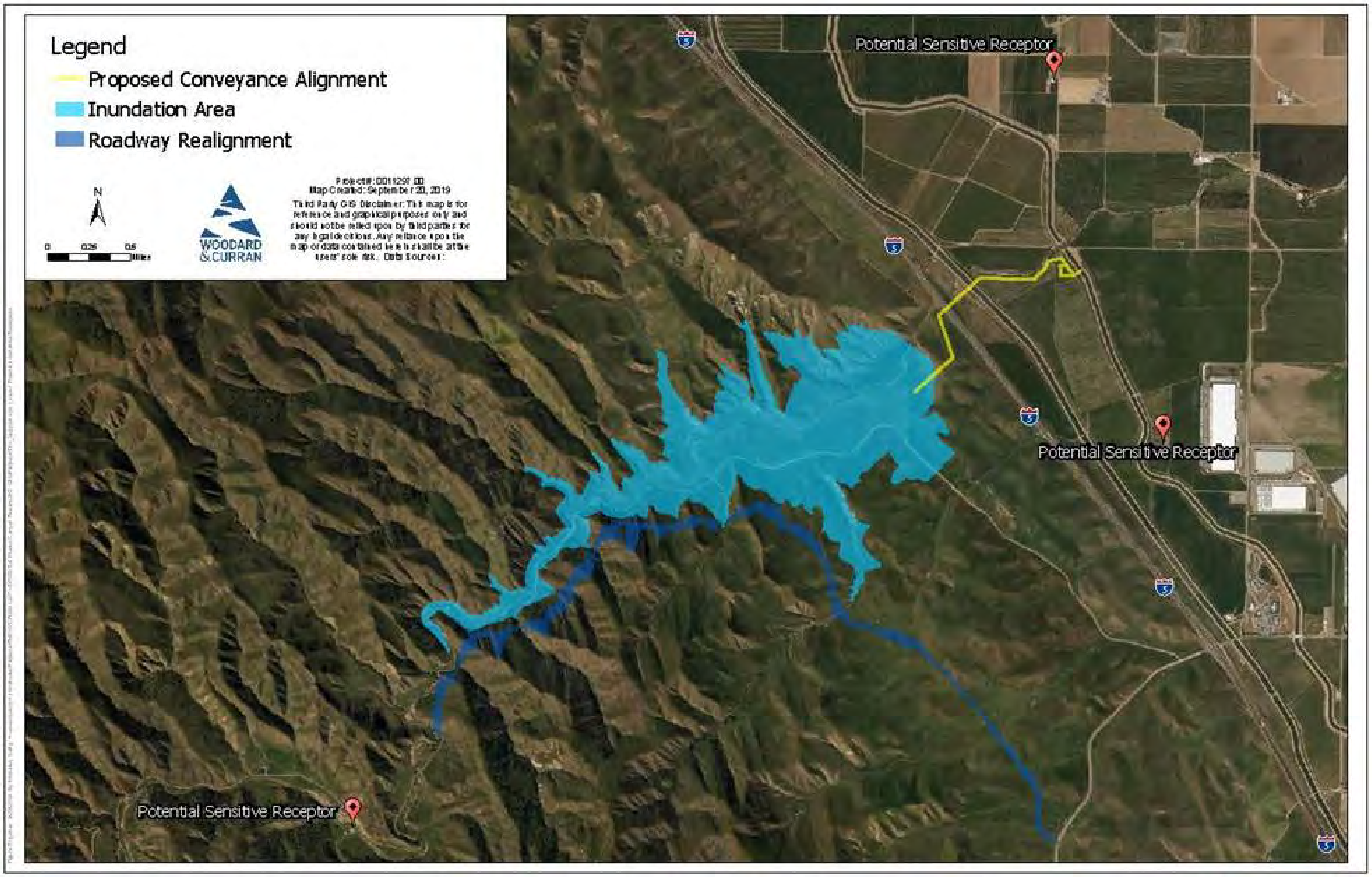
Table 3.3-2: Air Monitoring Data for 2016-2018

Pollutant	2016	2017	2018
Ozone (ppm), Worst 1-Hour	**0.105**	**0.114**	**0.108**
Number of days of State exceedances (>0.09 ppm)	8	3	7
Ozone (ppm), Worst 8-Hour Average	**0.092**	**0.1**	**0.096**
Number of days of State exceedances (>0.07 ppm)	29	35	27
Number of days of federal exceedances (>0.07 ppm)	31	36	30
Nitrogen dioxide (ppm), Worst 1-Hour	**0.047**	**0.059**	**0.067**
Number of days of State exceedances (>0.25 ppm)	0	0	0
Number of days of federal exceedances (>0.075 ppm)	0	0	0
Particulate matter <10 microns, mg/m^3, Worst 24-Hour Average	**152.2**	**298.4**	**250.2**
Number of days above State standard (>50 mg/m^3)	142	131	162
Number of days above federal standard (>150 mg/m^3)	0	2	2
Particulate matter <2.5 microns, mg/m^3, Worst 24-Hour Average	**53.6**	**74.5**	**189.8**
Number of days above federal standard (>35 mg/m^3)	14	31	26
Carbon Monoxide (ppm), Worst 1-Hour	**1.9**	**2**	**2.7**
Number of days of State exceedances (>20 ppm)	0	0	0
Number of days of federal exceedances (>35 ppm)	0	0	0
Carbon Monoxide (ppm), Worst 8-Hour Average	**1.5**	**1.6**	**2.1**
Number of days of State exceedances (>9 ppm)	0	0	0
Number of days of federal exceedances (>9 ppm)	0	0	0

Sensitive Receptors

Ambient air quality standards have been established to represent the levels of air quality considered sufficient, with an adequate margin of safety, to protect public health and welfare. They are designed to protect people most susceptible to respiratory distress, such as children under 14, persons over 65, persons engaged in strenuous work or exercise, and people with cardiovascular and chronic respiratory diseases. SJVAPCD identifies sensitive receptor locations as schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling units. The only sensitive receptors in the project area are rural residences. As shown in **Figure 3.3-1**, the nearest sensitive receptors identified are two residences located approximately 4,800 feet north and 5,000 feet south of the proposed pumping plant and one residence located 3,400 feet west of the end of the alignment of the new roadway. No other sensitive receptors were identified within a mile of the project area.

Figure 3.3-1: Sensitive Receptors within One Mile of Project



3.3.2 Regulatory Framework

This section describes applicable laws and regulations at the federal, State, regional, and local level.

Federal Policies and Regulations

The EPA is responsible for establishing NAAQS, enforcing the Federal Clean Air Act, and regulating transportation-related emission sources under the exclusive authority of the federal government.

Clean Air Act

The Clean Air Act governs air quality in the United States and is administered by the EPA. The EPA is responsible for setting and enforcing the NAAQS for atmospheric pollutants, which are presented in **Table 3.3-3**. EPA calls these pollutants "criteria" air pollutants because it regulates them by developing human health-based and/or environmentally-based criteria (science-based guidelines) for setting permissible levels. The set of limits based on human health is called primary standards. Another set of limits intended to prevent environmental and property damage is called secondary standards.

EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. The EPA also has jurisdiction over emission sources outside state waters (outer continental shelf) and establishes various emissions standards for vehicles sold in states other than California. As part of its enforcement responsibilities, the EPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan that demonstrates the means to attain the federal standards. The State Implementation Plan must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution, using a combination of performance standards and market-based programs within the timeframe identified in the State Implementation Plan.

Table 3.3-3: State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards – Primary	National Standards – Secondary
Ozone (O_3)	1 Hour	0.09 ppm	--	--
	8 Hour	0.070 ppm	0.070 ppm	Same as primary
Respirable Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	150 µg/m^3	Same as primary
	Annual Average	20 µg/m^3	--	--
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	--	35 µg/m^3	Same as primary
	Annual Average	12 µg/m^3	12.0 µg/m^3	15 µg/m^3
Nitrogen Dioxide (NO_2)	1 Hour	180 ppb	100 ppb	--
	Annual Average	30 ppb	53 ppb	Same as primary
Carbon Monoxide (CO)	1 Hour	20 ppm	35 ppm	--
	8 Hour	9.0 ppm	9 ppm	--
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm	0.075 ppm	--
	3 Hour	--	--	0.5 ppm
	24 Hour	0.04 ppm	0.14 ppm	--
	Annual Average	--	0.030 ppm	--

Source: California Air Resources Board 2016.

Corporate Average Fuel Economy Standards

The Corporate Average Fuel Economy standards were first enacted by Congress in 1975, requiring vehicle manufacturers to comply with the gas mileage or fuel economy standards. These standards are set and regulated by the National Highway Traffic Safety Administration, with testing and data support from EPA. The issued rules include fuel economy standards for light-, medium- and heavy-duty vehicles. More fuel-efficient vehicles result in lower emissions of air pollutants.

For light-duty vehicles, National Highway Traffic Safety Administration and EPA issued a joint final rulemaking on October 15, 2012 to establish coordinated standards to improve fuel economy and reduce greenhouse gas emissions for vehicle model years 2017 and beyond (77 FR 62624). EPA established standards that are projected to require, on an average industry fleet wide basis, 54.5 miles per gallon; the National Highway Traffic Safety Administration standards are projected to require, on an average industry fleet wide basis, a range from 40.3-41.0 miles per gallon. For medium- and heavy-duty vehicles, EPA and National Highway Traffic Safety Administration issued a final rule on December 27, 2016 on greenhouse gas emissions standards and fuel consumption standards for engines and vehicles model years 20218 through 2029 (81 FR 73478).

Off-road (Nonroad) Emission Regulations

EPA has adopted emissions standards for different types of off-road engines, equipment, and vehicles. For off-road diesel engines, EPA has adopted multiple tiers of emission standards.

EPA signed a final rule on May 11, 2004 introducing the Tier 4 emission standards, to be phased in between 2008 and 2015 (69 FR 38957–39273, June 29, 2004). EPA estimated the Tier 4 standards would result in emissions reductions of particulate matter of 95 percent, nitrogen oxides of 90 percent, and virtual elimination of sulfur oxides from off-road engines meeting the new standards. Such emission reductions would be achieved through the use of control technologies, including advanced exhaust gas after-treatment. To enable sulfur-sensitive control technologies in Tier 4 engines, such as catalytic particulate filters and nitrous oxides absorbers, EPA mandated reductions in sulfur content in off-road diesel fuels. In most cases, federal off-road regulations also apply in California, which has only limited authority to set emission standards for new off-road engines. The Clean Air Act preempts California's authority to control emissions from new farm and construction equipment under 175 horsepower (Clean Air Act Section 209[e][1][A]) and requires California to receive authorization from EPA for controls over other off-road sources (Clean Air Act Section 209[e][2][A]).

State Policies and Regulations

California Environmental Protection Agency

The California Environmental Protection Agency (Cal-EPA) is a state agency that includes CARB, the State Water Resources Control Board, nine Regional Water Quality Control Boards, the Integrated Waste Management Board, the Department of Toxic Substances Control, the Office of Environmental Health Hazard Assessment, and the Department of Pesticide Regulation. The mission of Cal-EPA is to restore, protect, and enhance the environment and to ensure public health, environmental quality, and economic vitality.

California Clean Air Act

The California Clean Air Act (CCAA) requires nonattainment areas to achieve and maintain the health-based State Ambient Air Quality Standards by the earliest practicable date. The California Clean Air Act is administered by CARB at the state level and by local air quality management districts at the regional level, whereby the air districts are required to develop plans and control programs for attaining the state standards (CAAQS). **Table 3.3-3** above shows the CAAQS.

CARB is responsible for ensuring implementation of the California Clean Air Act, meeting state requirements of the federal Clean Air Act, and establishing the CAAQS. It is also responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. CARB also establishes passenger vehicle fuel specifications.

In-Use Off-Road Diesel Vehicle Regulation

In 2007, CARB adopted a regulation to reduce diesel particulate matter and NO_x emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. The regulation imposes limits on unnecessary vehicle idling to five minutes and requires fleets to reduce emissions by retiring, replacing, repowering, or installing exhaust retrofits to older engines. The restrictions on adding older vehicles into fleets vary by fleet size. Heavy-duty diesel vehicle fleets may not add a vehicle with a Tier 0 or Tier 1 engine. For large and medium fleets, and in January 2023 for small fleets, a fleet may not add a vehicle with a Tier 2 engine, rather the engine must be Tier 3 or higher. By 2029, all fleets' vehicles must have Tier 2 or higher engines. This regulation would apply to vehicles used in construction of the proposed project.

Truck and Bus Regulation

On December 12, 2008, CARB approved a new regulation to substantially reduce emissions of diesel particulate matter, NO_x, and other pollutants from existing on-road diesel vehicles operating in California. The regulation requires affected trucks and buses to meet performance standards and requirements between 2011 and 2023. By January 1, 2023, nearly all trucks and buses will be required to have 2010 or newer model year engines. Affected vehicles included on-road, heavy-duty, diesel-fueled vehicles with a gross vehicle weight rating greater than 14,000 pounds. The regulation was updated in 2011, with revisions that provide more compliance flexibility and reflect the impact of the economic recession on vehicle activity and emissions. Heavy-duty trucks used in proposed project activities would have to comply with this regulation.

Commercial Vehicle Idling Regulation

The Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling requires that drivers of diesel-fueled commercial motor vehicles with gross vehicle weight ratings greater than 10,000 pounds, including buses and sleeper berth equipped trucks, not idle the vehicle's primary diesel engine longer than five minutes at any location. There are exceptions if a truck engine meets the optional low-NOx idling emission standard, and the truck is located more than 100 feet from any restricted area (clean idle label required), which include: housing units, schools, hotels, motels, hospitals, senior care facilities, or childcare facilities. Trucks used for vendor delivery and material hauling for proposed project activities would be required to comply with the commercial vehicle idling regulatory requirements.

Heavy-Duty On-Board Diagnostic System Regulations

In 2016, CARB approved the latest version of the Heavy-Duty On-Board Diagnostic systems regulations to reduce emissions by establishing standards and other requirements for onboard diagnostic systems that are installed on 2010 and subsequent model-year engines. The systems, through the use of an onboard computer, monitor emission systems in-use for the actual life of the engine and must be capable of detecting malfunctions of the monitored emission systems, illuminating a malfunction indicator light to notify the vehicle operator of detected malfunctions, and storing fault codes identifying the detected malfunctions. The use and operation of On-Board Diagnostic systems reduces in-use motor vehicle and motor vehicle engine emissions through improvements of emission system durability and performance. Heavy-duty trucks used for proposed project activities would be required to comply with the On-Board Diagnostic systems regulatory requirements.

Heavy-Duty Diesel Vehicle Enforcement

The Heavy-Duty Vehicle Inspection Program requires heavy-duty trucks and buses to be inspected for excessive smoke and tampering, and engine certification label compliance. Any heavy-duty vehicle (i.e., vehicles with a gross vehicle weight rating greater than 6,000 pounds) traveling in California, including vehicles registered in other states and foreign countries, may be tested. Tests are performed by CARB inspection teams at border crossings, California Highway Patrol weigh stations, fleet facilities, and randomly selected roadside locations. The related Periodic Smoke Inspection Program requires that diesel fleet owners conduct annual smoke opacity inspections of their vehicles and repair those with excessive smoke emissions to ensure compliance. CARB randomly audits fleets, maintenance and inspection records and tests a representative sample of vehicles. All vehicles that do not pass the test must be repaired and retested. In July 2018, CARB approved amendments to the regulations, which require heavy-duty vehicles to meet a more stringent opacity limit of 5 percent opacity for most vehicles. The new opacity limit went into effect July 1, 2019. In addition, each vehicle operating in California - including those in transit from Mexico, Canada, or any other state - must be equipped with engines that meet California and/or EPA or equivalent emission standards and must maintain an Emission Control Label. Heavy-duty trucks used for proposed project activities would be subject to these inspection programs.

California Diesel Fuel Program

The California diesel fuel program set stringent standards for California diesel that produced cost-effective emission reductions from diesel-powered vehicles. The diesel fuel program set specifications for aromatic hydrocarbons and sulfur and also established a lubricity standard.

Portable Engine Airborne Toxic Control Measure

The California Portable Engine Airborne Toxic Control Measure is designed to reduce the PM emissions from portable diesel-fueled engines rated at 50 brake horsepower or larger. Any electric or gas-powered backpack sprayer engines, or vehicle-mounted pump engines, such as dewatering pumps, that are smaller than 50 brake horsepower, would be exempt from this program. Portable diesel-fueled engines rated at 50 brake horsepower or larger are not expected to be used during proposed project activities.

Portable Equipment Registration Program

The statewide Portable Equipment Registration Program establishes a system to uniformly regulate portable engines and portable engine-driven equipment units. After being registered in this program, engines and equipment units may operate throughout the state without the need to obtain individual permits from air districts, although operation of registered portable engines still may be subject to certain district requirements for reporting and notification. Owners or operators of portable engines and certain types of equipment can voluntarily register their units under this program, while engines with less than 50 brake horsepower are exempt. Some of the engines used for the proposed project activities (i.e., those with less than 50 brake horsepower) would be exempt.

Senate Bill (SB) 709

SB 709 amends the Health and Safety Code to give the SJVAPCD more responsibility in terms of permitting, fee implementation, and agricultural assistance, as well as the authority to require the use of Best Available Control Technology (BACT) for existing emission sources, promote cleaner-burning alternative fuels, and encourage and facilitate ridesharing. SB 709 also amends the Vehicle Code to allow the San Joaquin Valley Air Pollution Control District (SJVAPCD) to adopt a surcharge on motor vehicle registration fees.

Regional Policies and Regulations

San Joaquin Valley Air Pollution Control District

The San Joaquin Valley Air Pollution Control District (SJVAPCD) is primarily responsible for assuring that the federal and State ambient air quality standards are attained and maintained in the San Joaquin Valley. Under State law, the SJVAPCD is required to prepare a plan for air quality improvement for pollutants for which the basin is in non-compliance. SJVAPCD has adopted numerous attainment plans to reduce ozone and particulate precursor emissions since 1992. Most recently, SJVAPCD adopted the 2016 Ozone Plan to bring the San Joaquin Valley into attainment of the federal 2008 8-hour ozone standard by

December 31, 2031. The Ozone Plan describes a comprehensive stationary and mobile source control strategy to reduce NO_X emissions by over 60 percent between 2012 and 2031.

SJVAPCD is currently preparing the 2017 $PM_{2.5}$ Plan as a single comprehensive attainment plan that addresses multiple $PM_{2.5}$ standards under the FCAA. Most recently, SJVAPCD adopted the 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard, which addresses the EPA federal annual $PM_{2.5}$ standard of 12 $\mu g/m^3$ established in 2012. The Moderate Area Plan addresses the fact that attainment of the 2012 $PM_{2.5}$ standard by 2021 is impracticable given that critical mobile source regulations, such as CARB truck and bus regulation and off-road engine regulation, will not be fully implemented until 2023. The Moderate Area Plan also requests reclassification of the region to ”Non-Attainment/Serious” with a new attainment deadline of 2025.

The SJVAPCD has implemented several regulations and rules, some of which are relevant to the proposed project. Applicability of each rule and regulation is described below.

SJVAPCD Rule 2020, Exemptions from Authority to Construct or Permit to Operate

Rule 2020 specifies emissions units that are not required to obtain an Authority to Construct or Permit to Operate under Rule 2201 (see below). An “emissions unit” is defined as an identifiable operation or piece of process equipment such as a source operation which emits, may emit, or results in the emissions of any affected pollutant directly or as fugitive emissions.

The rule exempts portable emissions units that have obtained a valid registration under Rule 2280 (see below) and specifically exempts portable generators that provide supplemental power during power interruptions, as long as the generator is not used for more than 60 calendar days. If operation of the proposed project were to include a backup standby generator, it <u>may</u> ~~would~~ qualify under this exemption. <u>Prior to the start of construction, DPWD would contact the SJVAPCD Small Business Assistance Office to determine if an Authority to Construct or Permit to Operate are required for the backup standby generator.</u>

SJVAPCD Rule 2201, New and Modified Stationary Source Review

Rule 2201 applies to new or modified stationary sources and requires that sources not increase emissions above specified thresholds. Best Available Control Technology (BACT) requirements are triggered on a pollutant-by-pollutant basis and on an emission unit-by-emissions unit basis for any new emissions unit with a potential to emit exceeding certain limits. Offsets are required if the post-project stationary source potential to emit equals or exceeds certain emissions offset threshold levels. Offset requirements are triggered on a pollutant-by-pollutant basis. The proposed project would include one new stationary source: an emergency generator at the pumping plant. The emergency generator would need to be permitted by the SJVAPCD and would have to comply with BACT requirements, but would not be subject to offset thresholds, which do not apply to emergency equipment that is used exclusively as emergency standby equipment for electric power generation.

SJVAPCD Rule 2280, Portable Equipment Registration

Portable equipment used at project sites for less than 6 consecutive months, such as diesel fired piston type internal combustion engines and spark ignition internal combustion engines, must be registered with either CARB or the SJVAPCD. Portable equipment used during project construction may have to comply with this rule. The proposed project would have a standby/emergency generator that would be used in the event of a power outage, but because it would be subject to New and Modified Stationary Source Review, it would not be subject to this rule.

SJVAPCD Rule 4002, National Emissions Standards for Hazardous Air Pollutants

Rule 4002 regulates emissions of asbestos associated with demolition and renovation projects. This rule would not be applicable to the proposed project activities because construction would not include renovation or demolition of existing buildings.

SJVAPCD Rule 4102, Nuisance

Rule 4102 prohibits emissions of air contaminants that would cause a nuisance to "considerable numbers of persons or the public." This rule would be applicable to the proposed project.

SJVAPCD Rule 4201 and Rule 4202, Particulate Matter Concentration and Emission Rates

Rule 4201 and Rule 4202 are applicable to the proposed project activities because they apply to operations that emit or may emit dust, fumes, or total suspended particulate matter. Particulate emissions must be less than the specified emissions limit.

SJVAPCD Rule 4601, Architectural Coatings

Rule 4610 specifies limits on VOC content of architectural coatings such as paint and would be applicable to any coatings used during project construction or maintenance activities. The VOC content of architectural coatings applied at the project site during construction would not exceed 100 grams VOC per liter for coating of piping, valves, pumps, tanks, and other on-site structures.

SJVAPCD Rule 4641, Cutback, Slow Cure, and Emulsified Asphalt, Paving, and Maintenance Operations

Rule 4641 limits VOC emissions by restricting the application and manufacturing of certain types of asphalt for paving and maintenance operations. Project construction and maintenance would comply with this rule.

SJVAPCD Rule 8011, General Requirements – Fugitive Dust Emission Sources

Fugitive dust regulations are applicable to outdoor fugitive dust sources. Project operations, including construction operations, must control fugitive dust emissions in accordance with SJVAPCD Regulation VIII: Control Measures for Construction Emissions of PM_{10}. According to Rule 8011, the SJVAPCD requires the implementation of control measures for fugitive dust emission sources. Dust management plans must be submitted to the SJVAPCD. The project would also implement the mandatory control measures listed in Table 6-2 in the Guidance for Assessing and Mitigating Air Quality Impacts (SJVAPCD 2015) to reduce fugitive dust emissions, which are listed below:

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.
- All onsite unpaved roads and offsite unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- With the demolition of buildings up to six stories in height, all exterior surfaces of the building shall be wetted during demolition.
- When materials are transported offsite, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday.
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.

- In urban areas, trackout shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.
- An owner/operator of any site with 150 or more vehicle trips per day, or 20 or more vehicle trips per day by vehicles with three or more axles shall implement measures to prevent carryout and trackout.

SJVAPCD Rule 9510, Indirect Source Review

Rule 9510 applies to any applicant seeking discretionary approval for a development project. Rule 9510 defines a development project to include any project that will result in the construction of a new building, facility, or structure (Section 3.13), and explains that the rule applies to any development project that would include 9,000 square feet of space at full build out (Section 2.0). Therefore, the proposed project would be subject to Indirect Source Review and would be required to submit an Air Impact Assessment (AIA) application to the SJVAPCD no later than applying for final discretionary approval. Compliance with Rule 9510, Indirect Source Review, would be a condition of project approval. ~~As a water supply project, the proposed project does not meet the definition of a development project and Rule 9510 is thus not applicable.~~

Voluntary Emission Reduction Agreements

The SJVAPCD administers a program to assist project proponents in mitigating air quality impacts by entering into a Voluntary Emission Reduction Agreement (VERA). These agreements provide a mechanism under which project proponents can voluntarily enter into a contractual agreement with the SJVAPCD to mitigate their project's impacts on air quality. Once entered into, VERAs become legally enforceable mechanisms for achieving air quality mitigation. Dollars provided by the project proponent are reinvested within the San Joaquin Valley Air Basin to reduce emissions. Using incentive grant programs, the funds provided through the VERA are awarded to Valley businesses, residents, and municipalities to generate real and quantifiable reductions in emissions. The following are some examples of how such funds can be utilized to reduce air pollution:

- Grants to Valley businesses and municipalities to replace old trucks with new low-emission trucks;
- Grants to Valley businesses and municipalities to electrify or replace existing diesel-powered off-road equipment;
- Grants to Valley residents to replace fireplaces and non-certified wood burning stoves with clean-burning EPA certified units;
- Grants to Valley residents through the District's Tune-In-Tune-Up program to repair older high-polluting vehicles;
- Grants to Valley residents to purchase cleaner vehicles; and
- Grants to Valley school districts to replace older and high-polluting school buses.

The emission reductions secured through VERAs are "surplus" to existing regulations, achieving reductions earlier or beyond those required by regulations. The SJVAPCD's incentive programs have invested over $1 billion in public and private funding for clean air projects reducing more than 100,000 tons of emissions. VERAs must be adopted before the start of project construction to ensure that emissions reductions and project emissions occur at the same time.

VERAs provide two emission reduction options: either the pollutant by pollutant option under which each pollutant is mitigated individually to the respective significance threshold level, or the net-zero option, which provides that the sum of NO_X, VOC and PM_{10} combined emissions is fully mitigated by the sum of NO_X, VOC and PM_{10} combined emissions reductions achieved under the VERA. The net zero mitigation option recognizes that NO_X is the critical component in San Joaquin Valley air quality issues and considers impacts to be less than significant for these three pollutants even if VOC or PM_{10} emissions remain above their individual significance thresholds after mitigation.

SJVAPCD CEQA Guidelines

The SJVAPCD prepared the Guidance for Assessing and Mitigating Air Quality Impacts to assist lead agencies and project applicants in evaluating the potential air quality impacts of projects in the San Joaquin Valley Air Basin (SJVAPCD 2015). It provides SJVAPCD-recommended procedures for evaluating potential air quality impacts from short-term (construction) and long-term (operational) air emissions during the CEQA environmental review process. It contains guidance on thresholds of significance and mitigation measures for criteria pollutant emissions, ambient air quality, toxic air contaminants, odors, accidental releases, and cumulative impacts.

SJVAPCD Ambient Air Quality Analysis – Stationary Source Projects

The SJVAPCD Guidance for Assessing and Mitigating Air Quality Impacts (SJVAPCD 2015) recommends that an ambient air quality analysis be performed when the increase in on-site emissions from construction activities exceeds the 100 pounds per day screening level of any criteria pollutant, after implementation of all enforceable mitigation measures. Likewise, for operational emissions, the Guidance recommends that an ambient air quality analysis be performed when the increase in on-site emissions from permitted or non-permitted equipment and activities exceeds the 100 pounds per day screening level of any criteria pollutant, after implementation of all enforceable mitigation measures. If an ambient air quality analysis is performed, the analysis should include emissions from both project specific permitted and non-permitted equipment and activities.

Local Policies and Regulations

Stanislaus County

The Stanislaus County General Plan has the following applicable air quality policies:

Goal Six: Improve Air Quality

Policy Eighteen: The County will promote effective communication, cooperation, and coordination among agencies involved in developing and operating local and regional air quality programs.

Implementation Measure 1: Refer discretionary projects under CEQA review to the SJVAPCD, neighboring jurisdictions and other affected agencies for review and comment.

Implementing Measure 2. Work with other agencies in the San Joaquin Valley to establish coordinated air quality programs and implementation measures.

Policy Nineteen: The County will strive to accurately determine and fairly mitigate the local and regional air quality impacts of proposed projects.

Implementation Measure 1: Require all development proposals, where appropriate, to include reasonable air quality mitigation measures.

Implementation Measure 2: Minimize case-by-case analysis of air quality impacts through the use of standard criteria for determining significant environmental effects, a uniform method of calculating project emissions, and standard mitigation methods to reduce air quality impacts.

3.3.3 Impact Analysis

Methodology for Analysis

This analysis follows the methodologies recommended in the SJVAPCD Guidance for Assessing and Mitigating Air Quality Impacts. The guidance document includes thresholds of significance for air emissions associated with both construction and operation of the proposed project.

Construction of the proposed project would involve large amounts of grading requiring use of construction equipment that generates criteria air pollutants, including diesel emissions and dust. Detailed construction schedules and grading estimates are summarized in *Section 2.4 of Chapter 2, Project Description*.

Emissions were calculated using the California Emissions Estimator Model (CalEEMod) software version 2016.3.2. CalEEMod is the SJVAPCD-recommended program to estimate anticipated emissions associated with projects in California. CalEEMod has separate databases for specific counties and air districts. The Stanislaus County-San Joaquin database was used for this analysis. CalEEMod contains numerous default assumptions and CARB emission factors for on-road and off-road vehicles (EMFAC 2014 and In-Use Off-Road Equipment Inventory Model 2011), which were incorporated into this analysis.

Construction was modelled based on information in *Section 2.4*. The modeling included 16 separate phases in CalEEMod for construction of each project component: roadway – excavation, roadway – grading and paving, conveyance – open cut trench, tunneling – outlet and conveyance, utilities – petroleum pipeline, utilities – transmission lines, pumping plant, dam facilities – site preparation, dam facilities – outlet works, dam facilities – main dam, dam facilities – spillway, dam facilities – saddle dams, dam facilities – site restoration, and phases to estimate emissions from worker pickup truck use during the open-cut trench, outlet works, and transmission line construction. The start date for each phase was based on the schedule shown in **Figure 2-9: Construction Sequence**. The length of each construction phase was based on either information from **Figure 2-9** (e.g., dam facilities phases, utilities phases) or in the absence of detailed equipment phasing information, conservatively assumed to equal the maximum number of days any construction equipment was scheduled to be used during that phase per the *Section 2.4* equipment inventory tables (e.g., roadway phase, tunneling phase, pumping plant phase, and conveyance phase). Thus, for those phases with less detailed equipment phasing information available at this time, all equipment described in *Section 2.4* is active for the maximum equipment use duration described. The "Utilities – Transmission Lines" phase would be intermittently phased during the first four years (720 workdays of total schedule time). Thus, the construction duration for the "Utilities – Transmission Lines" phase was scaled by the ratio of actual days to modeled days according to the actual length (462/720, or 64 percent).

The number of hours that each piece of construction equipment would be in use each day would vary by each equipment type. For example, most of the equipment for the roadway, pipelines, and utilities would be in use for 10 hours per day, with the exception of pumps, which would be in use 24 hours/day. Most of the equipment for construction of the pumping plant would be in use 6 hours per day, whereas most of the equipment for construction of the reservoir would be in use 20 hours per day, consistent with the expected two 10-hour daily shifts schedule.

Vendor trip assumptions were based on information in *Section 2.4*. Trips associated with concrete trucks, flatbed trucks, transfer dump trucks and trailers were characterized as vendor trips. Worker trips were based on information in *Section 2.4* when explicitly stated or assumed be 1.25 times the pieces of equipment not characterized as vendor equipment, consistent with CalEEMod default values. Emissions associated with hauling trips were captured in the inputs of grading material quantities. Grading input and export assumptions were based on information in *Section 2.4*.

Operation-related air emissions would result from mobile and area sources associated with ongoing operations and maintenance of the proposed facilities. Emissions would also result from existing vehicles traveling farther distances in response to the road relocation. The CalEEMod inputs were based on estimates of Vehicle Miles Traveled in the Transportation Impact Assessment - Del Puerto Canyon Reservoir (Fehr & Peers 2019), which is included in Appendix G.

Air emissions would also result from energy consumed to power the conveyance facilities, pumping plant, and other components. The project would construct new electrical facilities, including a power supply line and electrical substation to power the pumping plant. Stanislaus County is served by three energy providers: Pacific Gas and Electric (PG&E), Modesto Irrigation District (MID), and Turlock Irrigation District (TID). TID provides power to the study area and would likely supply energy required for project operation. Furthermore, for modeling purposes, TID has higher - therefore, more conservative - pollutant emissions factors than PG&E.

CalEEMod only calculates direct emissions of criteria pollutants from energy sources that combust on-site, such as natural gas. Criteria pollutant emissions from power plants are associated with the power plants themselves, which are stationary sources permitted by air districts and/or the EPA, and are subject to local, state and federal control measures. Thus, CalEEMod does not calculate or attribute emissions of criteria pollutants from electricity consumption to individual projects or electricity users. Criteria pollutants associated with the proposed project electricity facilities would be permitted stationary sources and would undergo separate permitting procedures that are assumed to result in emissions below the significance thresholds. Further detail on CalEEMod inputs and outputs are available in Appendix D.

A screening assessment was performed to determine if emissions from construction or operations would exceed 100 pounds per day of any criteria pollutant, which would trigger the recommendation for an ambient air quality analysis. The screening assessment found that with incorporation of all feasible mitigation, only CO emissions during construction would be greater than 100 pounds per day. ~~(equivalent to 18 tons per year). However, annual CO emissions would be lower than the SJVAPCD significance levels (100 tons per year, see **Table 3.3-4**),~~ ~~t~~Therefore, it was determined that an ambient air quality analysis would ~~not~~ be necessary.

For toxic air contaminants, a screening assessment was performed, which included all sources of emissions using the SJVAPCD "prioritization calculator."[1] The prioritization screening found that with implementation of on-site NOX reduction measures (see **Mitigation Measure AIR-1**), diesel particulate matter (DPM) emissions resulted in a prioritization score of 10 or less at distances beyond 1,000 meters from the project area. SJVAPCD recommends conducting a refined analysis if a project results in a prioritization score of 10 or more. Because all receptors are more than 1,000 meters from the project area, it was determined that there is no need for refined health risk assessment modeling.

For odors, the methodology for analyzing whether potential odor impacts would occur is based on SJVAPCD experience and data regarding similar facilities in similar settings. This analysis relied on the SJVAPCD screening table of specific facilities and categories of facilities, and associated odor complaint records (**Table 3.3-6**). Nuisance odors are assessed qualitatively, taking into consideration project design elements, proximity to off-site receptors that potentially would be exposed to objectionable odors, local meteorological conditions, and the nature of the odor source.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines*, as updated in December 2018 an impact on air quality would be considered significant if the project would:

- Conflict with or obstruct implementation of the applicable air quality plan;

[1] http:www.valleyair.org/busind/pto/emission_factors/Criteria/Toxics/Utilities/PRIORITIZATION%20RMR%202016.XLS.

- 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;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The Initial Study determined that the project would not have significant impacts associated with the criterion below; however, the SJVAPCD noted in its July 24 comment letter (SJVAPCD 2019) that the project should be evaluated to determine the likelihood that it would result in nuisance odors. SJVAPCD stated nuisance odors should be assessed qualitatively. Therefore, this criterion is addressed in the EIR.

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

Criteria Pollutant Thresholds

The SJVAPCD has developed quantifiable significance thresholds for criteria pollutant emissions and their application is presented in the following table.

Table 3.3-4: SJVAPCD Significance Thresholds for Criteria Air Pollutants

Pollutant / Precursor	Construction Emissions	Operational Emissions – Permitted Equipment and Activities	Operational Emissions – Non-Permitted Equipment and Activities
	Tons / year	Tons / year	Tons / year
CO	100	100	100
NO_X	10	10	10
ROG	10	10	10
SO_X	27	27	27
PM_{10}	15	15	15
$PM_{2.5}$	15	15	15

SJVAPCD advises (SJVAPCD 2015) that the significance of a project's impacts of the emissions from construction, operational non-permitted equipment and activities, and operational permitted equipment and activities be evaluated separately, even if the timing of construction and operation overlaps. The thresholds of significance are based on a calendar year basis. For construction emissions, the annual emissions are to be evaluated on a rolling 12-month period.

CO Hotspots

The SJVAPCD has established (SJVAPCD 2015) that preliminary screening can be used to determine with fair certainty that the effect a project has on any given intersection would not result in a CO hotspot. Therefore, SJVAPCD has established that if neither of the following criteria are met at all intersections affected by the development project, the project will result in no potential to create a violation of the CO standard: 1) A traffic study for the project indicates that the Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity will be reduced to LOS E or F; or 2) A traffic study indicates that the project will substantially worsen an already existing LOS F on one or more streets or at more or more intersections in the project vicinity. If either of the above criteria can be associated with any intersection affected by the project, the applicant/consultant would need to conduct a CO analysis to determine a project's significance. The proposed project is not a development project and would generate extremely limited operational traffic. The requirement for a CO hotspot analysis is thus not applicable to this project.

Toxic Air Contaminants

In addition to the above thresholds for criteria pollutant emissions, the SJVAPCD recommends conducting a screening analysis for toxic air contaminants that includes all sources of emissions, with a refined analysis if a project results in a prioritization score of 10 or more. SJVAPCD (SJVAPCD 2015) thresholds of significance for toxic air contaminant (TAC) emissions from the operations of both permitted and non-permitted sources are combined and presented in the following table.

Table 3.3-5: SJVAPCD Significance Thresholds for Toxic Air Contaminants

Carcinogens	Maximally Exposed Individual risk equals or exceeds 10 in one million
Non-Carcinogens – Acute	Hazard Index equals or exceeds 1 for the Maximally Exposed Individual
Non-Carcinogens – Chronic	Hazard Index equals or exceeds 1 for the Maximally Exposed Individual

Carcinogenic (cancer) risk is expressed as cancer cases per one million. Non-carcinogenic (acute and chronic) hazard indices (HI) are expressed as a ratio of expected exposure levels to acceptable exposure levels. The significance of the impacts of TAC emissions from both permitted and non-permitted equipment and activities is evaluated under a single threshold, for example 10 in one million.

Odors

According to SJVAPCD (SJVACPD 2015), any project with the potential to frequently expose members of the public[2] to objectionable, nuisance odors should be deemed to have a significant impact. Odor impacts on residential areas and other sensitive receptors, such as hospitals, day-care centers, and schools warrant the closest scrutiny, but consideration should also be given to other land uses where people may congregate, such as recreational facilities, worksites, and commercial areas. The following table from SJVAPCD Guidance for Assessing and Mitigating Air Quality Impacts (SJVAPCD 2015) was used as a screening analysis for evaluating nuisance odor impacts on nearby receptors from the proposed project.

[2] Note that the Lead Agency considers the threshold of significance for “other” emissions, including odors, to be “substantial numbers” of people, consistent with the CEQA Guidelines.

Table 3.3-6: SJVAPCD Screening Levels for Potential Odor Sources

Type of Facility	Distance (miles)
Wastewater Treatment Facilities	2
Sanitary Landfill	1
Transfer Station	1
Composting Facility	1
Petroleum Refinery	2
Asphalt Batch Plant	1
Chemical Manufacturing	1
Fiberglass Manufacturing	1
Painting/Coating Operations (e.g., auto body shops)	1
Food Processing Facility	1
Feed Lot/Dairy	1
Rendering Plant	1

Small Project Analysis Level Screening Tool

To streamline the process of assessing significance of criteria pollutant emissions from commonly encountered projects, SJVAPCD (SJVAPCD 2017) developed the Small Project Analysis screening tool to conclude that a project would not exceed applicable thresholds of significance for criteria pollutants. The SJVAPCD pre-calculated the emissions on a large number of types of projects to identify the level at which they have no possibility of exceeding the emissions thresholds. The screening information is provided in terms of vehicle trips required to exceed the threshold for five general land use categories.

Table 3.3-7: SJVAPCD Small Project Analysis Level by Vehicle Trips

Land Use Category	Project Size (Vehicle Trips per Day)
Residential Housing	1,452
Commercial	1,673
Office	1,628
Institutional	1,707
Industrial	1,506

Ambient Air Quality Analysis

SJVAPCD recommends (SJVAPCD 2015) that an ambient air quality analysis be performed when the increase in on-site emissions from construction and/or operation exceeds the 100 pounds per day screening level of any criteria pollutant, after implementation of all enforceable mitigation measures.

The following significance thresholds, which are derived from the NAAQS and CAAQS for NO_X and from the New Source Review/Prevention of Significant Deterioration for CO, apply to the results of the ambient air quality analysis.

Table 3.3-8: SJVAPCD Ambient Air Quality Analysis Significance Thresholds

CO 1-hour: 2,000 μg/m^3
CO 8-hour: 500 μg/m^3
NO_X 1-hour NAAQS: 100 ppb (188 μg/m^3)
NO_X 1-hour CAAQS: 180 ppb (339 μg/m^3)
NO_X annual average NAAQS: 53 ppb (100 μg/m^3)
NO_X annual average CAAQS: 30 ppb (57 μg/m^3)

Cumulative Impacts

Air pollution impacts have a cumulative effect. The current ambient air conditions in the San Joaquin Valley are a result of past, present, and future activities. Project impacts may be individually limited, but cumulatively considerable.

Per CEQA Guidelines §15064(h)(3) a project's incremental contribution to a cumulative effect is not considered cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program, including, but not limited to an air quality attainment or maintenance plan that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located.

The SJVAPCD has adopted attainment plans that demonstrate how SJVAPCD will attain and maintain the National Ambient Air Quality Standards, consistent with Clean Air Act requirements. The plans are developed through a public process, formally adopted by the State, and submitted to the EPA.

The SJVAPCD attainment plans are a regional component of the State Implementation Plan. The State Implementation Plan incorporates regional, planned growth forecasts (e.g., general plans, regional transportation plan) to estimate annual increases in air pollutant emissions. The State Implementation Plan assumes the growth forecasts will be subject to the stationary, area, and indirect source control measures that are contained in the State Implementation Plan when estimating air pollutant emissions. Therefore, projects that are consistent with the regional planning forecasts would be consistent with the State Implementation Plan, the associated SJVAPCD attainment plans, and would not have a cumulatively considerable effect.

For criteria pollutants, the thresholds of significance set by the SJVAPCD (**Table 3.3-4**) (SJVAPCD 2015) are applied to evaluate regional impacts of project specific emissions of air pollutants. The thresholds of significance for criteria pollutant emissions are based on SJVAPCD New Source Review offset requirements for stationary sources. The SJVAPCD attainment plans demonstrate that project specific emissions below the offset thresholds will have a less than significant impact on air quality.

Impacts and Mitigation Measures

Impact AIR-1 Conflict with or Obstruct Implementation of the Applicable Air Quality Plan

Construction and Operation Impacts

<u>Conflicts with implementation of applicable air quality plans are most typically a result of development projects that entail substantial changes in existing land use (e.g. conversion of agricultural land to residential or commercial development) or propose growth that exceeds planned growth forecasts or that generates substantial additional travel between residential areas and employment centers. These types of projects can generate emissions in excess of projected levels that would impair the ability to obtain air quality objectives for the region and at a state level.</u> The proposed project would replace undeveloped, grazing lands with a reservoir, and associated facilities, which would supply irrigation water to existing agricultural land uses. The general plan (Stanislaus County 2016) land use designation for the project site

is Agriculture for the proposed reservoir, and the proposed conveyance facilities' land use designations are Agriculture, Mixed Use, Light Industrial and Commercial. The Agricultural land use designation (Stanislaus County 2016) establishes agriculture as the primary use, but allows, "uses which by their unique nature are not compatible with urban uses, provided they do not conflict with the primary use." The Mixed Use, Light Industrial, and Commercial designations would be minimally impacted by the proposed conveyance, utilities and roadway facilities, as most proposed project components would be located underground or have a relatively small footprint in these areas. The proposed project would not substantially ~~obstruct~~ increase the expected regional development of commercial, industrial or mixed-use land uses and thus would not be expected to substantially change regional emissions in a way that would obstruct SJVAPCD attainment plans.

Significance before Mitigation

As explained in the *Thresholds of Significance* section, projects that are consistent with the regional planning forecasts would be consistent with the State Implementation Plan, and component SJVAPCD attainment plans. The proposed project would be largely consistent with the land use designation for the proposed project site, as defined in the general plan (Stanislaus County 2016). Furthermore, the proposed project would serve irrigation water to established agricultural uses and would not induce unplanned growth or development of additional, unplanned agricultural operations. Therefore, the proposed project would not conflict with or obstruct implementation of the applicable air quality plans and impacts would be less than significant.

Mitigation Measures

No mitigation measures are needed.

Impact AIR-2 Increase of Nonattainment Criteria Pollutants

Construction Impacts

Construction of the proposed project would result in temporary emissions of criteria pollutants for which the San Joaquin Air Basin is classified non-attainment. The use of construction equipment, worker, vendor and hauling vehicles would result in emissions of CO, and ozone precursors, NO_X and VOC. The application of architectural coatings for coatings of piping, valves, pumps, tanks, and other on-site structures would result in VOC emissions. Soil disturbing activities, including site clearing, grubbing, excavating, and grading, as well as driving vehicles on unpaved roads, would result in emissions of particulate matter, $PM_{2.5}$ and PM_{10}. Diesel Particulate Matter, a subset of $PM_{2.5}$, would be emitted by the proposed construction equipment.

Construction emissions were estimated in CalEEMod and are summarized and compared to SJVAPCD significance thresholds in **Table 3.3-9**. It was assumed that project construction would implement the mandatory control measures listed in Table 6-2 in the Guidance for Assessing and Mitigating Air Quality Impacts (SJVAPCD 2015) to reduce fugitive dust emissions.

Table 3.3-9: Estimated Unmitigated Construction Emissions for Criteria Pollutants (tons/year)

Pollutant/Year	Total	Threshold	Exceeded?
CO			
2022	7.269	100	NO
2023	18.014	100	NO
2024	42.075	100	NO
2025	70.460	100	NO
2026	58.558	100	NO
2027	3.305	100	NO
NO_X			
2022	6.982	10	NO
2023	**22.744**	**10**	**YES**
2024	**49.671**	**10**	**YES**
2025	**71.883**	**10**	**YES**
2026	**59.228**	**10**	**YES**
2027	3.016	10	NO
ROG			
2022	0.780	10	NO
2023	2.400	10	NO
2024	5.503	10	NO
2025	8.751	10	NO
2026	7.393	10	NO
2027	0.364	10	NO
SO_X			
2022	0.013	27	NO
2023	0.046	27	NO
2024	0.116	27	NO
2025	0.204	27	NO
2026	0.173	27	NO
2027	0.008	27	NO
PM_{10}			
2022	1.141	15	NO
2023	4.292	15	NO
2024	9.641 ~~834~~	15	NO
2025	12.229 ~~309~~	15	NO
2026	10.301	15	NO
2027	0.231	15	NO
$PM_{2.5}$			
2022	0.615	15	NO
2023	2.435	15	NO
2024	4.587 ~~693~~	15	NO
2025	6.411 55	15	NO
2026	5.461	15	NO
2027	0.132	15	NO

Operation Impacts

Once operational, the proposed project would emit criteria pollutants each year over the lifespan of the project, which is estimated to be at least 100 years. Criteria pollutants would result of additional operations and maintenance worker vehicle trips, which would be minimal, and increased vehicle miles travelled associated with the roadway realignment, referred to as "mobile" sources. Emissions from "area" sources would result from limited landscaping. As explained under the Methodology for Analysis, above, criteria pollutant emissions from the electricity consumed by the proposed pumping station would be attributed to Turlock Irrigation District (or Pacific Gas and Electric), not the proposed project. Furthermore, the proposed project electricity facilities would be permitted stationary sources and would undergo separate permitting procedures that are assumed to result in emissions below the significance thresholds. Annual operational emissions were estimated in CalEEMod and are summarized and compared to SJVAPCD significance thresholds in **Table 3.3-10**.

Significance before Mitigation

The Project Partners would comply with all applicable CARB and SJVAPCD regulations in place at the time the project is constructed, including off-road emissions regulations, vehicle idling restrictions, and fugitive dust emissions controls. In addition, the required dust management plan would be submitted to the SJVAPCD. Watering the site and controlling off-road vehicle speed on unpaved roads, as required by SJVAPCD Rule 8011, General Requirements – Fugitive Dust Emission Sources would reduce emissions of PM_{10} and $PM_{2.5}$ to lower than SJVAPCD annual construction emissions thresholds and thus would be less than significant.

Construction-related emissions of CO and ROG are expected to come close to the established annual thresholds in year 4 of construction but would not exceed the SJVAPCD annual construction emissions thresholds and thus would be less than significant.

As mentioned in the Initial Study and demonstrated in the emissions estimates in **Table 3.3-10**, emissions during operation related to routine maintenance activities would be limited. Annual estimated emissions are well below the thresholds set by SJVAPCD and less than significant.

Even with compliance with existing federal, State, and local measures, the proposed project has the potential to exceed thresholds for NO_X during each of the construction years 2, 3, 4, and 5. To reduce emissions of NO_X from construction activities, implementation of **Mitigation Measure AIR-1** would reduce NO_X emissions through on-site measures to below significance thresholds, or require a VERA, which would reduce emission to a less-than-significant level.

Table 3.3-10: Estimated Operational Emissions for Criteria Pollutants (tons/year)

Pollutant/Category	Emissions	Threshold	Exceeded?
CO			
Area	0.117	100	No
Energy	0	100	No
Mobile	0.043	100	No
Waste	0	100	No
Water	0	100	No
NO_X			
Area	0.001	10	No
Energy	0	10	No
Mobile	0.041	10	No
Waste	0	10	No
Water	0	10	No
ROG			
Area	0.011	10	No
Energy	0	10	No
Mobile	0.004	10	No
Waste	0	10	No
Water	0	10	No
SO_X			
Area	0.00001	27	No
Energy	0.0	27	No
Mobile	0.0003	27	No
Waste	0.0	27	No
Water	0.0	27	No
PM_{10}			
Area	0.0004	15	No
Energy	0	15	No
Mobile	0.021	15	No
Waste	0	15	No
Water	0	15	No
$PM_{2.5}$			
Area	0.0004	15	No
Energy	0	15	No
Mobile	0.006	15	No
Waste	0	15	No
Water	0	15	No

Mitigation Measures

Mitigation Measure AIR-1: Reduce NO_X Emissions

NO_X emissions associated with construction activities shall be reduced to 10 tons per year through on-site equipment and hauling vehicle mitigation measures to the extent feasible. All vehicles and equipment used during construction shall be maintained and properly tuned in accordance with the manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. Emissions reduction methods may be chosen from any combination of the following measures:

- Use of alternative fueled vehicles
- Use of newer tier engines
- Use of phased material hauling trips
- Use of after-market pollution control devices to reduce emissions
- Lengthening the construction schedule to reduce the annual intensity of construction activities

After certification of the DEIR, but before emissions associated with proposed project activities begin, the Del Puerto Water District shall be responsible for producing a SJVAPCD-approved air quality impact assessment analysis to determine the projected maximum project emissions which incorporates the most current proposed equipment fleet, hours of operation, duration of work, and on-site NO_X reduction measures, based on final project design and phasing. If all feasible on-site measures have been implemented and annual emissions are anticipated to still be above 10 tons per year for NO_X, then the Project Partners shall enter into a Voluntary Emissions Reduction Agreement (VERA) with SJVAPCD. The VERA would provide pound-for-pound mitigation of air emissions increases down to a net zero emissions per year as required under general conformity through a process that develops, funds, and implements emission reduction projects. To ensure emission reductions targeted by the VERA occur at the same time as project emissions, and thereby achieve net zero annual emissions, the Project Partners shall enter into a VERA with SJVAPCD prior to the release of NO_X emissions associated with proposed project activities. SJVAPCD would serve as administrator of the emissions reduction projects and verifier of the successful mitigation effort.

Under the VERA, the Project Partners shall agree to mitigate project-specific emissions by providing funds for the SJVAPCD's Emission Reduction Incentive Program (ERIP). The funds would be disbursed by ERIP in the form of grants for projects that achieve emission reductions. Types of emission reduction projects that have been funded in the past include electrification of stationary internal combustion engines (such as agricultural irrigation pumps), replacing old heavy-duty trucks with new, cleaner, more efficient heavy-duty trucks, and replacement of old farm tractors. The Project Partners would request that funding disbursement priority would be given to emission reduction projects of Partner landowners. The initial agreement would generally be based on the projected maximum emissions increases as calculated by a SJVAPCD-approved air quality impact assessment and contain the corresponding maximum fiscal obligation. However, because the goal is to mitigate actual emissions, the SJVAPCD has designed flexibility into the VERA such that the final mitigation would be based on actual emissions related to the project as determined by actual equipment used, hours of operation, and duration of work. After the project is mitigated, the SJVAPCD would certify to the lead agency that the mitigation is completed, providing the lead agency with an enforceable mitigation measure demonstrating that project-specific emissions have been mitigated to less than significant.

Significance after Mitigation

Implementation of **Mitigation Measure AIR-1** would reduce NO_X emissions as much as possible through on-site measures. For the purposes of this analysis, the proposed project construction activities emissions were estimated in CalEEMod with the assumption that 92 percent of the construction equipment fleet would have Tier 4 engines[3] and all hauling trips would be phased. The results are presented in **Table 3.3-11**.

[3] It was assumed the Project Partners would employ a construction vehicle fleet with enough Tier 4 engines so as not to result in significant emissions of toxic air contaminants in the project area. After several CalEEMod sensitivity runs, it was determined that a fleet with 92.2% Tier 4 engines (260 out of 282 total pieces of equipment) would fall below the toxic air contaminant screening score of 10.

Table 3.3-11: Estimated Mitigated Construction Emissions for Criteria Pollutants (tons/year)

Pollutant/Year	Total	Threshold	Exceeded?
CO			
2022	8.151	100	NO
2023	22.866	100	NO
2024	54.605	100	NO
2025	93.231	100	NO
2026	78.328	100	NO
2027	3.988	100	NO
NO_X			
2022	1.541	10	NO
2023	4.291	10	NO
2024	**10.316**	**10**	**YES**
2025	**16.777**	**10**	**YES**
2026	**14.035**	**10**	**YES**
2027	0.663	10	NO
ROG			
2022	0.209	10	NO
2023	0.752	10	NO
2024	1.772	10	NO
2025	2.981	10	NO
2026	2.531	10	NO
2027	0.118	10	NO
SO_X			
2022	0.013	27	NO
2023	0.046	27	NO
2024	0.116	27	NO
2025	0.204	27	NO
2026	0.173	27	NO
2027	0.008	27	NO
PM_{10}			
2022	0.841	15	NO
2023	3.472	15	NO
2024	7.927	15	NO
2025	9.870	15	NO
2026	8.383	15	NO
2027	0.134	15	NO
$PM_{2.5}$			
2022	0.337	15	NO
2023	1.684	15	NO
2024	3.018	15	NO
2025	4.250	15	NO
2026	3.706	15	NO
2027	0.042	15	NO

Implementing on-site NO_X emissions reduction measures could lower emissions to less than significant levels in year 2. However, converting 92 percent of construction equipment engines to Tier 4 and phasing all hauling trips may not be feasible. Furthermore, even if the proposed project used a fleet composed of 92 percent Tier 4 engines and phased all hauling trips, NO_X emissions in years 3, 4, and 5 would still be significant. Given that total annual emissions during project construction may still exceed significance thresholds for the San Joaquin Valley Air Basin, Del Puerto Water District would enter into a VERA with the SJVAPCD. A VERA would implement off-site emissions reduction projects and thereby provide pound-for-pound mitigation of air pollutant exceedances to achieve net zero emissions per year. At the request of the Project Partners, funding disbursement priority would be given to emission reduction projects of Partner landowners. With incorporation of **Mitigation Measure AIR-1**, impacts would be less than significant with mitigation incorporated.

As explained under the Thresholds of Significance, above, SJVAPCD recommends (SJVAPCD 2015) that an ambient air quality analysis be performed when the increase in on-site emissions from construction and/or operation exceeds the 100 pounds per day ~~(or 18 tons per year, on average)~~ screening level of any criteria pollutant, after implementation of all enforceable mitigation measures. As shown in **Table 3.3-11**, with implementation of all enforceable mitigation, no criteria pollutant having a significant level of emissions would exceed 100 pounds per day, except CO ~~(or 18 tons per year)~~. CO emissions were estimated to be greater than 100 pounds per day and therefore require an ambient air quality analysis. ~~(18 tons per year); however, these emissions are below the significance threshold for CO (100 tons per year) and thus would constitute an insignificant amount of emissions.~~

An Ambient Air Quality Analysis was conducted using the conservative SCREEN3 model and results are presented below.

Carbon Monoxide Ambient Air Quality Analysis

The maximum single-year carbon monoxide (CO) emission rate for the project-wide emissions would be 93.231 tons per year, or 510.855 pounds per day, which exceeds the 100 pounds per day SJVAPCD threshold triggering the requirement for an Ambient Air Quality Analysis. The “Dam Facilities - Main Dam” construction phase is projected to have the maximum annual CO emissions compared to all other proposed project construction phases; therefore, for modeling purposes, a portion of the “Dam Facilities - Main Dam” construction area was selected as the area over which the project-wide emissions would be spread out in the model. The area over which CO would be emitted during this phase is conservatively modeled to be 914,932 square feet (though the actual area would be much larger, thus dispersing emissions and reducing downwind concentrations). Following guidance[4], the conservative screening model SCREEN3 was employed to evaluate the maximum project-wide emission rate (510.855 lbs/day) as an area source using a 914,932-square-foot portion of the “Dam Facilities – Main Dam” construction phase area. These model input assumptions are conservative because the maximum annual project-wide emissions would be associated with a much larger area. The model inputs are listed in **Table 3.3-12** below.

Table 3.3-12: SCREEN3 Area Source Inputs

CO Emission Rate (lb/hr/ft2)	Source Release Height (ft)	Area Source Side Length (ft)
0.000023	0	956.5

The immediate area surrounding the project is largely rural, thus SCREEN3 was run using the rural dispersion coefficient configuration. In addition, surface-based receptors (0 ft above ground) and full

[4] *Guidance for Air Dispersion Modeling*, San Joaquin Valley Air Pollution Control District. Accessed from https://www.valleyair.org/busind/pto/Tox_Resources/Modeling%20Guidance.pdf on 3/18/2020. The SCREEN3 model is inherently more conservative than a more refined model like AERMOD because the screening model assumes preset, or “worst case,” meteorology, whereas a more refined model would use actual meteorology.

meteorology were used. Receptors were automatically placed between 25 and 1,000 meters to capture the maximum 1-hour modeled concentration. The maximum 1-hour impact was modeled to be 5,028 µg/m3, which is above the 1-hour and 8-hour Significant Impact Levels (SILs) for CO, meaning the modeled impact should be evaluated with ambient background CO concentration included. Thus, background ambient air CO concentrations were added to the maximum SCREEN3 modeled concentration to be compared to the California Ambient Air Quality (CAAQS) and National Ambient Air Quality Standards (NAAQS) for 1-hour and 8-hour CO. Adding a maximum 3-year highest-second-high[5] 1-hour CO background value taken from a nearby representative monitor of 2,863 µg/m3 to the maximum modeled impact results in a downwind ambient air concentration of 7,891 µg/m3, which is well below the 1-hour CO CAAQS of 23,000 µg/m3 and the NAAQS of 40,000 µg/m3. Conservatively using the maximum 1-hour modeled CO concentration as an 8-hour CO concentration and adding in the representative 8-hour CO background value results in a downwind ambient air **Table 3.3-13** below summarizes the SCREEN3 assessment.

Table 3.3-13: SCREEN3 Model Results and CAAQS Comparison

CO Averaging Period	SCREEN3 Maximum Downwind Impact (µg/m3)[1]	Background Concentration (µg/m3)[3]	SCREEN3 Model + Background (µg/m3)	CO CAAQS / NAAQS (µg/m3)	Result
1-hour	5,028	2,863	7,891	23,000 / 40,000	Passes
8-hour	5,028[2]	2,176	7,204	10,000 / 10,000	Passes

Notes:
[1] See Appendix D for SCREEN3 model data.
[2] Conservatively taken as 1-hour maximum.
[3] See Appendix D for background concentration data. EPA AIRS data, Site ID: 060990005, Modesto, CA. Maximum highest-second-high of latest three years (2016, 2017, 2018. 2019 incomplete) of available data for each averaging period.

Based on this conservative screening modeling, the project would not cause or contribute to a violation of the state or federal air quality standards and no further analysis is required. The ambient air quality analysis confirms that with mitigation, impacts would be less than significant.

Impact AIR-3 Sensitive Receptors

Land uses such as residences, schools, day care centers, hospitals, and convalescent homes are considered to be more sensitive than the general public to certain environmental effects, and thus are collectively known as sensitive receptors. There are no schools, day care centers, hospitals, or convalescent homes within 1 mile of the proposed project site and adjacent land uses. While the study area is not designated as residential in the Stanislaus County General Plan, there are three rural residential homes scattered within 1 mile of the proposed project (see **Figure 3.3-1**). However, none of these residences are within the area of the proposed project and adjacent land uses. The residential neighborhoods in the City of Patterson closest to the proposed project area are approximately 1.7 miles to the east.

Construction Impacts

Construction has the potential to temporarily expose nearby sensitive receptors to CO and toxic air contaminants, including diesel particulate matter. A screening assessment was performed, which included all sources of emissions using the SJVAPCD "prioritization calculator" and assumed implementation of all feasible mitigation (**Mitigation Measure AIR-1**). SJVAPCD recommends conducting a refined

[5] The air quality standards for CO are not to be exceeded more than once per year, thus, the typical concentration evaluated as a background is the form of the standard: the 2nd high concentration over the course of each year is taken; the highest 2nd high over all the years evaluated is taken as the background value.

analysis if a project results in a prioritization score of 10 or more. The prioritization screening found that diesel particulate matter (DPM) emissions resulted in a prioritization score of 10 or less at a distance at and beyond 1,000 meters (3,281 feet) from the project. All sensitive receptors are more than 1,000 meters from the project area, thus there is no need for refined health risk assessment modeling.

Operation Impacts

Project operations would rely on electricity provided by Turlock Irrigation District (or Pacific Gas and Electric), which is subject to local, state and federal control measures that control criteria pollutant emissions at the grids' power plants themselves. The project would have minimal maintenance vehicle trips and is expected to result in minimal additional VMT for existing vehicles on the proposed relocated road (less than 200 additional VMT per year) (Fehr & Peers 2019). As such, the potential for the project's operational emissions to expose sensitive receptors to substantial pollutant concentrations is considered to be a less than significant impact.

Significance before Mitigation

Without mitigation, construction could expose sensitive receptors to substantial pollutant concentrations, which would be a significant impact. The proposed project would not directly generate emissions from combustion of fuels on site and emissions of criteria and hazardous pollutants from production of electricity would be minimal. Maintenance of the reservoir and pumping plant is estimated to result in up to one worker vehicle trip per day. Operation would thus have a less than significant impact on sensitive receptors and no mitigation would be required.

Mitigation Measures

See Mitigation Measure AIR-1.

Significance after Mitigation

The health risk screening assessment shows that, with incorporation of **Mitigation Measure AIR-1**, construction emissions would not exceed the SJVAPCD prioritization score of 10 and thus a refined Health Risk Assessment is not needed to determine if construction emissions would exceed SJVAPCD standards for toxic air contaminants, including standards for non-carcinogens and carcinogens (cancer risk).

Impact AIR-4 Odors

Construction Impacts

During construction, heavy construction equipment would emit SO_X, which can be described as having a rotten egg smell. Odors tend to dissipate rapidly with distance. Roadway paving is associated with odors from the tar and coatings. As implied in **Table 3.3-6**, even the most egregious sources of long-term odors dissipate to a less than significant level at a distance of 2 miles. Furthermore, Del Puerto Water District considers the threshold of significance for "other" emissions, including odors, to be "substantial numbers" of people, consistent with the CEQA Guidelines. While there are three rural residential homes amongst agricultural lands within 1 mile of the proposed project site, the project site and surrounding area is considered rural and devoid of "substantial numbers" of people. Odor impacts from operation of diesel construction equipment and roadway paving activities would be temporary and are expected to dissipate at the distance of the nearby receptors. Furthermore, as shown in **Table 3.3-9**, emissions of SO_X would be relatively low, resulting in minimal odiferous emissions during the use of heavy construction equipment.

Operation Impacts

Operation of the proposed project would involve occasional operation and maintenance trips, a slight increase in vehicle miles travelled for existing users of the road that will be relocated, and operation of the pumping plant and electrical substation. As explained in the Initial Study and shown in **Table 3.3-6**, none of these activities are associated with permanent odors that could cause odor complaints.

Reservoirs can be impacted by algal blooms. The potential for algal blooms rises during hot conditions when water levels in reservoirs are low and the water temperature increases, causing stagnation. Nutrients - phosphorous and nitrogen - from runoff from the adjacent grazing lands could accumulate in the reservoir, exacerbating the potential for algal blooms. Combined with sunlight, this creates ideal conditions for algae to rapidly propagate (i.e. bloom). A “harmful algal bloom” is the term for an algal bloom that has the potential to be dangerous to animals, people, or the local environment. Harmful algal blooms can produce toxins that result in illness. An algal bloom that becomes dense enough to keep sunlight from reaching the lower depths of the water, is also considered a harmful algal bloom. When organisms in a bloom die and decompose, they can release unpleasant odors. Harmful algal blooms may remove oxygen from the water as the algae decomposes, starving plants in the water body of oxygen, which decompose as well and contribute to the odor. Analysis of the potential for algal blooms is included in *Section 3.11, Hydrology and Water Quality*.

While algal blooms have the potential to cause odors, several factors influence whether an odor will occur and the severity of the odor: the size of the algal bloom, the duration of the algal bloom, excess blooms of other vegetation (if caused by excess nutrients), and whether there is a fish die-off. Odors from a possible algal bloom in the proposed reservoir are expected to be characterized by the decomposition of plant-based organic matter. Because the reservoir would not be stocked with fish for recreational fishing, the reservoir is not expected to support a substantial fish population which, if starved of oxygen from an algal bloom could cause more offensive odors in the event of a die off than the decomposition of plants. For this reason, odors from a possible algal bloom at the proposed reservoir are expected to be significant at a distance comparable to that of a composting facility, or feed lot (see significance distances in **Table 3.3-6**), which also produce odors from the decomposition of plant-based organic matter. In a worst-case scenario, an algal bloom at the reservoir could be associated with excess blooms of other vegetation spurred by nutrient run-off into the reservoir from the surrounding agricultural practices. However, because the City of Patterson is more than 1.5 miles away, outside the distance where odor impacts are projected to be perceptible, impacts are expected to be less than significant.

Significance before Mitigation

Odor impacts from construction would be temporary, dissipate rapidly, and would not impact substantial numbers of people. None of the activities associated with regular operations and maintenance of the reservoir are expected to result in odor impacts. There is a risk of algal blooms when reservoir temperature levels increase, which could result in receptors within 1 mile of the proposed reservoir being exposed to brief periods of unpleasant odors. However, the reservoir is located sufficiently far enough away from substantial numbers of people such that impacts would be less than significant.

Mitigation Measures

As described in *Section 2.3.2* of the *Project Description*, the reservoir would be managed to minimize algal blooms to the extent possible. No additional mitigation has been determined to be feasible or necessary.

Cumulative Impact Analysis

The geographic scope of the cumulative impacts on air quality encompasses the San Joaquin Valley Air Basin. A list of cumulative projects is presented in **Table 3.0-1**. If the proposed project would result in cumulatively considerable emissions of any air pollutant, such that the ambient air quality in the San Joaquin Valley Air Basin were to decline, it could result in significant cumulative impacts.

As explained under the *Thresholds of Significance* section above, cumulative air quality impacts are determined by 1) evaluating a project’s consistency with regional planning forecasts; and 2) evaluating the project’s estimated emissions against the thresholds of significance in **Table 3.3-4**. This is because SJVAPCD attainment plans, which are regional components of the State Implementation Plan, are based on regional planning forecasts and the expectation that individual projects will be subject to New Source Review.

According to the results of the health risk screening, impacts related to toxic air contaminants and sensitive receptors are expected to be less than significant. Therefore, the proposed project is not expected to considerably contribute to a cumulative toxic air contaminant impact.

Combined with the projects that may be under construction concurrently with the proposed project, odor impacts during construction and regular operation are expected to not be cumulatively considerable because they would be temporary and/or not impact substantial numbers of people. There are no cumulative projects that would generate odors. Odor impacts associated with algal blooms would be less than significant and less than cumulatively considerable.

As analyzed under *Impact AIR-1*, the proposed project would be consistent with regional growth projections, and, therefore, the regional attainment plans and State Implementation Plan. However, as explained under *Impact AIR-2*, emissions of NO_X, which is an ozone precursor and for which the San Joaquin Air Basin is designated nonattainment, would exceed thresholds of significance. Emissions of NO_X from construction activities would be considered a considerable contribution to a significant cumulative impact. Implementation of **Mitigation Measure AIR-1** would reduce construction air emissions to levels below SJVAPCD's construction significance thresholds. Therefore, with implementation of **Mitigation Measure AIR-1**, the incremental contribution of the proposed project would not be cumulatively considerable.

Significance Determination

With incorporation of feasible mitigation measures, all air quality resource impacts would not be cumulatively considerable.

Mitigation Measures

See Mitigation Measure AIR-1.

3.3.4 References

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3.4 Biological Resources—Terrestrial

This section evaluates the potential terrestrial biological impacts associated with implementation of the proposed project. *Terrestrial resources* comprise vegetation, wildlife, natural communities, and wetlands and other waters. For the purpose of this analysis, the study area includes terrestrial resources in the vicinity of the facilities to be constructed or modified under the proposed project. Information about terrestrial resources in the study area was obtained primarily from wildlife surveys and an aquatic resources delineation conducted in the spring and summer of 2019. ~~A b~~ Botanical surveys of the study area was conducted in the fall of 2019 and the spring of 2020.

3.4.1 Environmental Setting

The discussion below defines the terms used in the terrestrial evaluation and describes the terrestrial conditions of the region and study area.

Study Area

The study area includes the footprints of the proposed project infrastructure, the maximum inundation area, areas where utilities may need to be relocated, any areas of potential disturbance related to constructing the proposed project, and a 300 foot buffer around these areas to identify sensitive biological resources that could be affected during project construction and/or operations.

Methods for Assessing Existing Biological Resources in the Study Area

Potential biological resource issues associated with the proposed project were identified through a review of existing information. It was determined that the following studies and surveys would be required to document existing natural resources in the study area.

- General habitat evaluation to determine whether suitable habitat exists for special-status plant and animal species; this was performed by ICF biologists May 2019 through July 2019.
    - Placing motion activated trail cameras near the mouth of Del Puerto Canyon for a total of two weeks in mid to late June 2019.
    - Recording wildlife observations made during field surveys.
- A delineation of waters of the United States and Waters of the State; this was done by ICF biologists on June 17–20, 2019, and July 26, 2019.
- Botany surveys; these were conducted by ICF biologists October 28–31, 2019 and March 26-April 8, 2020.

To prepare for the field surveys, biologists reviewed existing resource information related to the project to evaluate whether special-status species or other sensitive biological resources (e.g., waters of the United States) could occur in the study area. The following sources were reviewed.

- California Native Plant Society's (CNPS's) online Inventory of Rare and Endangered Plants of California (2019) (Appendix B1, *Species Lists*).
- California Natural Diversity Database (CNDDB) nine quadrangle plant records search around study area (California Department of Fish and Wildlife 2019a) (Appendix B1, *Species Lists*).
- CNDDB animal species records within 5 miles of the study area (California Department of Fish and Wildlife 2019b) (Appendix B1, *Species Lists*)
- U.S. Fish and Wildlife Service's (USFWS) IPaC list of endangered and threatened species that may occur in or be affected by the proposed project (U.S. Fish and Wildlife Service 2019a) (Appendix B1, *Species Lists*).

- The soil map unit descriptions for the study area (Natural Resources Conservation Service 2019a).
- Patterson and Copper Mountain 7.5-minute U.S. Geological Survey topographic quadrangles (U.S. Geological Survey 1971, 1978).

This information was used to develop lists of special-status species and other sensitive biological resources that could be present in the project region. Species from the lists were considered if they were known to occur in the project region (i.e., within a 5-mile radius of the study area) or if potential habitat for the species was known to be present in the study area.

~~Limitations that May Influence Results~~

~~A fall botanical field survey was performed for the study area. However, because spring botanical field surveys were not conducted, special-status plants were assumed to be present if potentially suitable habitat is present. The vegetation mapping has not been field-verified, and sensitive plant communities may be present that could not be identified by the vegetation mapping.~~

Project Vicinity

The study area is in the foothills of the Diablo Range in Del Puerto Canyon, west of the city of Patterson, in Stanislaus County. It is characterized by rolling hills, generally sloping from west to east. Elevations range from about 650 feet along the west side to 180 feet near I-5. The defining feature of the study area is Del Puerto Creek, an intermittent stream that is tributary to the San Joaquin River. The stream flows primarily during the winter and spring, and some stream reaches are dry during the summer and fall. Other reaches are supported by groundwater and remain inundated or saturated throughout the year, supporting riparian woodland and wetlands. Reaches further downstream and east of I-5 are primarily supported by agricultural drainage, particularly in the fall and summer.

The climate in the study area is characterized by hot, dry summers and cool, relatively wet winters, depending on the water year type. The average high temperatures range from 96.1°F in July to 55.4°F in January, and the average low temperatures range from 35.5°F in December to 59.5°F in July (Natural Resources Conservation Service 2019b). The average annual precipitation is 11.52 inches, with precipitation falling entirely as rain, mostly between October and April.

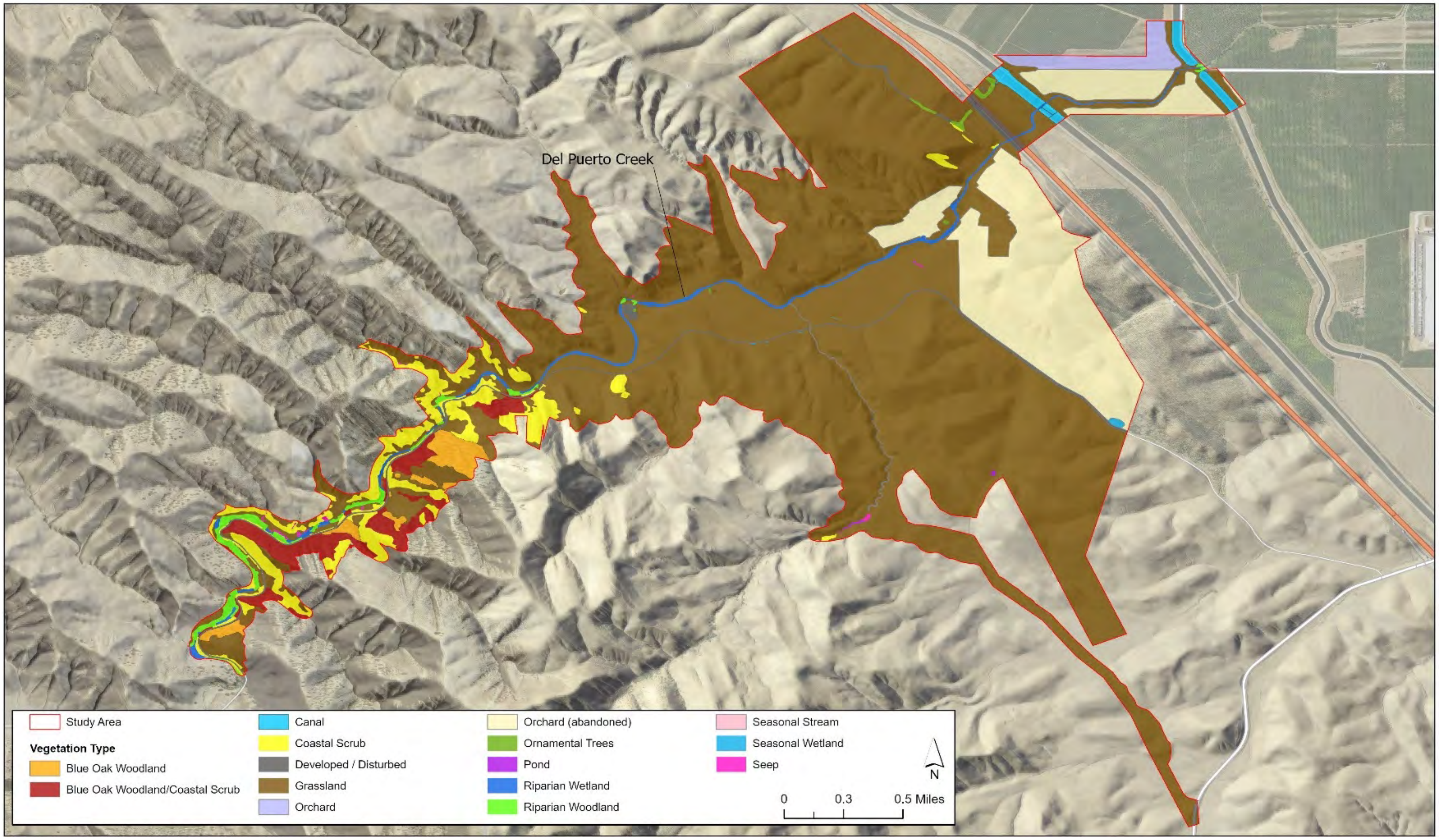
Vegetation Types

The survey area is predominantly vegetated by natural vegetation, and eleven vegetation types were mapped from aerial photographs of the survey area (Google Earth 2019). The vegetation types are listed in **Table 3.4-1**, which provides area estimates for each type, and are shown in **Figure 3.4-1.** The most abundant plant community is grassland, with areas of coastal scrub and blue oak woodland in the steep canyons of the west side of the survey areas. Riparian woodland and wetlands are present along Del Puerto Creek, and a few small ponds, seasonal seeps, and isolated seasonal wetlands are scattered across the survey area. Abandoned orchards are present on about 318 acres on the east side of the study area. A total of ~~181~~ 297 plant species were observed during the Aquatic Resources Delineation Survey and botanical surveys ~~or have been collected in or near the study area (Consortium of California Herbaria 2019)~~. A list of these plant species is provided in Table 2 of Appendix B2, *Species Observed in the Study Area.* More detailed descriptions of each vegetation type are provided in Appendix B3, *Memorandum regarding Special-Status Plant Assessment–Del Puerto Canyon Reservoir Project*.

Table 3.4-1: Land Cover Types in the Study Area and Approximate Acreages

Vegetation/Land Cover Type	Amount in Study Area (acres)
Grasslands	1,545
Blue Oak Woodland	26
Coastal Scrub	98
Blue Oak Woodland / Coastal Scrub	53
Riparian Woodland	17
Riparian Wetlands	24
Seeps	1.8
Seasonal Wetlands	1
Ponds	0.6
Ornamental Trees	3
Orchard	318
Unvegetated Areas	
Paved Roads	19
Canals	17

Figure 3.4-1: Vegetation Map



Grassland

Most of the study area vegetation consists of grassland, an herbaceous community dominated by naturalized annual grasses intermixed with other native and naturalized perennial and annual grasses and forbs. Grassland is found throughout the study area, occupying about 1,475 acres.

Coastal Scrub

Coastal Scrub is a shrub-dominated community occurring in the Coast Ranges within the area having a maritime influence on the climate. Coastal scrub is present on steep slopes in the western side of the survey area, occupying about 98 acres.

Blue Oak Woodland

Blue oak woodland is the common oak woodland alliance occurring in the foothills adjacent to the Central Valley. Blue oak woodland with an understory consisting primarily of grasses and forbs occupies about 18 acres. Blue oak woodland with a well-developed shrub layer of coastal scrub species is more extensive, occupying about 37 acres.

Riparian Woodland

Sections of Del Puerto Creek where trees are present were mapped as Riparian Woodland. This vegetation type occupies about 17 acres, primarily in the western part of the study area.

Riparian Wetlands

Riparian wetlands are present in the channel of Del Puerto Creek and along the banks, within the floodplain. Approximately 24 acres of riparian wetlands are present in the study area. These wetlands are primarily characterized by herbaceous plants. Del Puerto Creek is an intermittent stream containing several pools that remain inundated into late summer due to subsurface flows and seeps along Del Puerto Canyon. A smaller seasonal stream that is tributary to Del Puerto Creek is present in the central part of the study area. This stream has wetland vegetation along the channel like those present along the margins of Del Puerto Creek, but appears to have seasonal flows only.

Seep Wetlands

Seep wetlands are present at scattered intervals along the channels of ephemeral drainages, mostly in the west half of the study area. These drainages lack evidence of prolonged stream flow, such as scour or a well-defined bed and banks, but at some locations along the channels, groundwater-supported seeps are present. About 1.8 acre of seep wetlands are present in the study area.

Ponds

Four ponds were identified in the study area consisting of approximately 0.6 acres. Three of these ponds are inundated during the rainy season and are dry during the dry season. They are relatively shallow and were observed dry by the time of the May 2019 surveys. One of these ponds is a natural sag pond, whereas the other two are stock ponds formed by placing dams across swales. The fourth stock pond was observed inundated during the July 22, 2019 field visit.

Seasonal Wetlands

Seasonal wetlands are freshwater wetlands that support ponded or saturated soil conditions during winter and spring and are dry through the summer and fall until winter rainfall begins to saturate the soil. About 1 acre of seasonal wetlands were identified in the study area during the wetland delineation survey.

Ornamental Trees

Several small stands of ornamental trees are present in the study area, near the former California Department of Forestry station and adjacent to the orchards, that are in the general proximity of I-5.

Orchards

The study area adjacent to and east of Interstate 5 was planted with orchard crops sometime prior to 1998. Orchards were also planted west of the mouth of Del Puerto Canyon, starting in 2008; however, these orchards are not within an irrigation district and have not been maintained, and the trees have died. These abandoned orchards occupy about 318 acres of the survey area.

Unvegetated Areas

While most of the study area is undeveloped and vegetated with grasses, there are some areas that are developed with either roads, buildings or canals. Paved roads in the study area include I-5 and Del Puerto Canyon Road. Interstate 5 is a four-lane divided highway with unpaved shoulders and a mown median strip. Del Puerto Canyon Road is a two-lane road with a very narrow shoulder. These roads total about 18.5 acres.

One building is present at the site of the former Del Puerto Fire Control Station. An old water tower and livestock corrals are associated with this building. The building and corrals total about 1.6 acres. Two canals cross the east end of the study area, the California Aqueduct and the Delta-Mendota Canal (DMC). Both of these canals have concrete-lined banks. The DMC is flanked by one paved road with both gravel and dirt on the eastern side and a dirt and gravel road on the western side. These canals comprise about 17 acres.

Wetlands and Other Waters

Wetlands subject to federal and state jurisdiction include riparian woodland, riparian wetlands, seasonal wetlands, seeps, and ponds, as described in the preceding paragraphs. The acreages presented in **Table 3.4-1** are preliminary, as the wetland delineation has not been subjected to jurisdictional review by the federal and state agencies. The extent to which federal and state agencies may exert jurisdiction is likely to differ because of differences in federal and state laws and regulations.

Natural Communities of Special Concern

Natural communities of special concern are habitats considered sensitive because of their high species diversity, high productivity, unusual nature, limited distribution, or declining status. Local, state, and federal agencies consider these habitats important, and compensation for loss of sensitive communities is generally required by agencies. The CNDDB contains a current list of rare natural communities throughout the state (California Department of Fish and Wildlife 2018a). USFWS considers certain habitats, such as riparian communities, important to wildlife; and the U.S. Army Corps of Engineers (USACE) and Environmental Protection Agency (EPA) consider stream habitats important for water quality and wildlife. Waters of the United States and Waters of the State are regulated by the USACE and the Regional Water Boards, respectively.

One natural community of special concern, riparian woodland is present in the study area. Riparian woodland in the study area is classified as Fremont cottonwood forest, which has a State rarity of S3, which is defined as vulnerable in the state due to a restricted range, relatively few populations, recent and widespread declines, or other factors making it vulnerable to extirpation.

Special-Status Species

Appendix B4, *Special Status Species Tables*, Tables B4-1 and B4-2 list special-status plant and wildlife species, respectively, that are known to occur or have the potential to occur in the geographic region (within 5 miles of the study area). These species were identified based on the CNDDB records search (California Department of Fish and Wildlife 2019a, b), the CNPS Inventory of Rare and Endangered Plants (2019), the USFWS species list (U.S. Fish and Wildlife Service 2019a) (Appendix B1, *Species Lists*), and species distribution and habitat requirements data.

For the purpose of this EIR, special-status species are plants and animals that are legally protected under the Endangered Species Act (ESA), the California Endangered Species Act (CESA), or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such listing. Special-status plants and animals are those species in any of the categories listed below:

- Species listed or proposed for listing as threatened or endangered under ESA (50 CFR 17.11 [listed animals], 50 CFR 17.12 [listed plants], and various notices in the Federal Register [FR] [proposed species]).
- Species that are candidates for possible future listing as threatened or endangered under ESA (81 FR 87246, December 2, 2016).
- Species listed or proposed for listing by the State of California as threatened or endangered under CESA (14 CCR 670.5).
- Plants listed as rare under the California Native Plant Protection Act (CFGC 1900 et seq.).
- Plants with a California Rare Plant Rank (CRPR) of 1 or 2 (California Department of Fish and Wildlife 2019c).
- Animal species of special concern to California Department of Fish and Wildlife, Special Animals List (California Department of Fish and Wildlife 2019d).
- Animals fully protected in California (CFGC Section 3511 [birds], 4700 [mammals], 5050 [amphibians and reptiles], and 5515 [fish])

Special-Status Plants

Thirty-five special-status plant species occur in or within 15 miles of the study area (California Department of Fish and Wildlife 2019; California Native Plant Society 2019) (Appendix B4, *Special-Status Species Tables*, Table B4-1). ~~No~~ <u>Fall and spring botanical field</u> surveys for special-status plant species have been <u>conducted</u> ~~done~~ within the study area~~; therefore, all species present in the study area vicinity were evaluated for their potential to occur in the study area, based on the known range of each species and their habitat associations~~ (Appendix B3, *Memorandum regarding Special-Status Plant Assessment–Del Puerto Canyon Reservoir Project*). ~~Four~~ <u>Eigh</u>teen of the species are not known to occur in the study area, and no potential habitat for these species is present in the study area. These species are not addressed further. The following discussion focuses on the ~~4~~ <u>5</u> species that occur in the study area<u> or have been reported from the study area</u>. The other 1<u>2</u> ~~7~~ species that have the potential to occur in the study area are discussed in Appendix B3.

Big Tarplant

Big tarplant has no state or federal listing status but has a California Rare Plant Rank of 1B.1. Its range is limited to the eastern San Francisco Bay Area and adjacent San Joaquin Valley. Big tarplant occurs in annual grassland on clay to clay-loam soils, usually on slopes and often in burned areas, below 1,500 feet. There are 53 known occurrences, five of which are in Stanislaus County. Three occurrences have been reported from the study area. No data is available for many of the occurrences for current status, size of the occurrence, or number of plants present. Most of the occurrences are small; only three occurrences are larger than 25 acres in area. During the fall botany survey, 54 stands of big tarplant were mapped in or adjacent to the study area. These stands totaled 45.25 acres within the study area and an additional 15.65 acres adjacent to the study area. Based on these observations, the Del Puerto Canyon occurrences represents a single metapopulation that ranks as the second-largest known occurrence. The Del Puerto Canyon occurrence is also significant because it represents the southernmost locality for the species.

Lemmon's Jewelflower

Lemmon's jewelflower has no state or federal listing status but has a California Rare Plant Rank of 1B.1. It ranges from the southeastern San Francisco Bay area south into the South Coast Ranges and adjacent San Joaquin Valley, from Alameda to Ventura Counties. Lemmon's jewelflower grows on dry exposed slopes in grasslands and pinyon-juniper woodlands, generally between 260 and 4,000 feet above sea level. There are 86 known occurrences, only one of which is in Stanislaus County. It was collected in the study area near the mouth of Del Puerto Canyon during the 1930s. Although the population has not been relocated since the original collection, it is presumed to be extant. Lemmon's jewelflower was not found in the study area during the spring botanical survey. However, because total rainfall in January and February was 14% of normal, Lemmon's jewelflower may not have produced seedlings.

Diamond-petaled California Poppy

Diamond-petaled California poppy has no state or federal listing status but has a California Rare Plant Rank of 1B.1. It ranges from the southeastern San Francisco Bay area south into the South Coast Ranges and adjacent San Joaquin Valley, from Alameda to San Luis Obispo counties. Diamond-petaled California poppy grows on clay soils in grasslands. There are twelve known occurrences, one of which is in Stanislaus County. It was last collected in the study area near the mouth of Del Puerto Canyon in 1940. Although the occurrence has not been relocated since the original collection, it is presumed to be extant. Diamond-petaled California poppy was not found in the study area during the spring botanical survey. However, because total rainfall in January and February was 14% of normal, diamond-petaled California poppy may not have produced seedlings.

California Alkali Grass

California alkali grass has no state or federal listing status but has a California Rare Plant Rank of 1B.2. It occurs at scattered locations in the San Francisco Bay Area, Great Valley, Tehachapi Mountains, and the western Mojave Desert. The plants grow in seasonally wet alkaline wetlands, sinks, flats, vernal pools, and playa margins. There are 80 known occurrences; the only known occurrence from Stanislaus County was last observed in 1935 and has been extirpated. A new, previously undocumented occurrence of California alkali grass was observed and mapped in the study area during the aquatic resources delineation survey. This new occurrence is locally significant, as it represents the only known extant occurrence in Stanislaus County.

San Benito Poppy

Diamond-petaled California poppy has no state or federal listing status but has a California Rare Plant Rank of 4.3. It ranges throughout the interior South Coast Ranges. It grows in grasslands and open areas in woodland and chaparral, often on barren clay, shale, or serpentine substrates. There are several occurrences reported from Del Puerto Canyon, including the study area. San Benito poppy was mapped at three locations within the study area. A total of 45 plants were observed in a combined area of less than 0.01 acre.

Special-Status Wildlife

Based on a review of the CNDDB search results; the USFWS list of endangered, threatened, and proposed species within the project region; and species distribution and habitat data, 28 special-status wildlife species were determined to have the potential to occur in the project region (Appendix B4, *Special-Status Species Tables*, Table B4-2). After a review of species distribution and habitat requirements and information gathered during surveys, the ICF wildlife biologists determined that 6 of the 28 species would not occur in the study area because the area lacks suitable habitat for the species or is outside the species' known range. Table B4-2, in Appendix B4, provides an explanation for the absence of each of these species from the study area. The 22 wildlife species that may occur in the study area or that could be affected by the proposed project are discussed below for those federally listed, state listed, and fully protected species, and the other special-status wildlife species are discussed in Appendix B5, *Special-Status Wildlife Accounts (Excluding Listed and Fully Protected Species)*. Appendix B6, *Photos of Study Area*, identifies photos of habitats identified during the field work.

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp is federally listed as threatened. Vernal pool fairy shrimp occur in the Central Valley, and central and south Coast Ranges from Tehama County to Santa Barbara County. They inhabit vernal pools and sandstone rock outcrop pools that lack fish, as vernal pool fairy shrimp do not have anti-predator defenses. These pools are temporary and form in depressions with an impervious substrate layer (U.S. Fish and Wildlife Service 2007a). Vernal pool fairy shrimp occur only in cool water pools and are known to die off when pool temperatures get too warm. Offspring persist in the dry season as cysts until water returns in the winter, allowing cysts to hatch (U.S. Fish and Wildlife Service, 2007a).

There are no CNDDB occurrences within 5 miles of the study area. The closest CNDDB occurrence is approximately 6 miles north of the study area (California Department of Fish and Wildlife 2019).

ICF biologists surveyed for and assessed the study area for habitat for vernal pool fairy shrimp, which included surveying for signs of ponding, recording associated vegetation, and noting signs of occupancy by other aquatic invertebrates [e.g., carapaces of seed shrimp (Ostracods)]. Locations of potential aquatic habitat were recorded using GPS and the limits were mapped as part of the wetland delineation. Potential habitat for vernal pool fairy shrimp was identified in seasonal wetlands within the study area, specifically in seasonal wetlands along and near the existing Del Puerto Canyon Road, a seasonal pool within the roadway realignment, and in a seasonal pond in the east portion of the study area, within the existing utilities corridor.

Vernal Pool Tadpole Shrimp

The vernal pool tadpole shrimp is federally listed as endangered. They occur in highly fragmented habitat from Shasta County south to Merced County, and inhabit vernal pools/lakes, and other seasonal wetlands (U.S. Fish and Wildlife Service 2007b). Like the vernal pool fairy shrimp, vernal pool tadpole shrimp produce cysts that persist in the pool substrate until the next rainy season allows them to hatch. Vernal pool tadpole shrimp inhabit pools that range from 50 to 84 degrees Fahrenheit, and feed on detritus and living organisms, such as fairy shrimp (U.S. Fish and Wildlife Service 2007b).

There are no CNDDB occurrences within 5 miles of the study area. The closest CNDDB occurrence is approximately 12 north of the study area (California Department of Fish and Wildlife 2019).

ICF biologists surveyed for and assessed the study area for habitat for vernal pool tadpole shrimp, which included surveying for signs of ponding, recording associated vegetation, and noting signs of occupancy by other aquatic invertebrates [e.g., carapaces of seed shrimp (Ostracods)]. Locations of potential aquatic habitat were recorded using GPS and the limits were mapped as part of the wetland delineation. Potential habitat for vernal pool tadpole shrimp was in seasonal wetlands within the study area, specifically in seasonal wetlands along and near the existing Del Puerto Canyon Road, a seasonal pool within the roadway realignment, and in a seasonal pond in the east portion of the study area, within the existing utilities corridor.

Valley Elderberry Longhorn Beetle

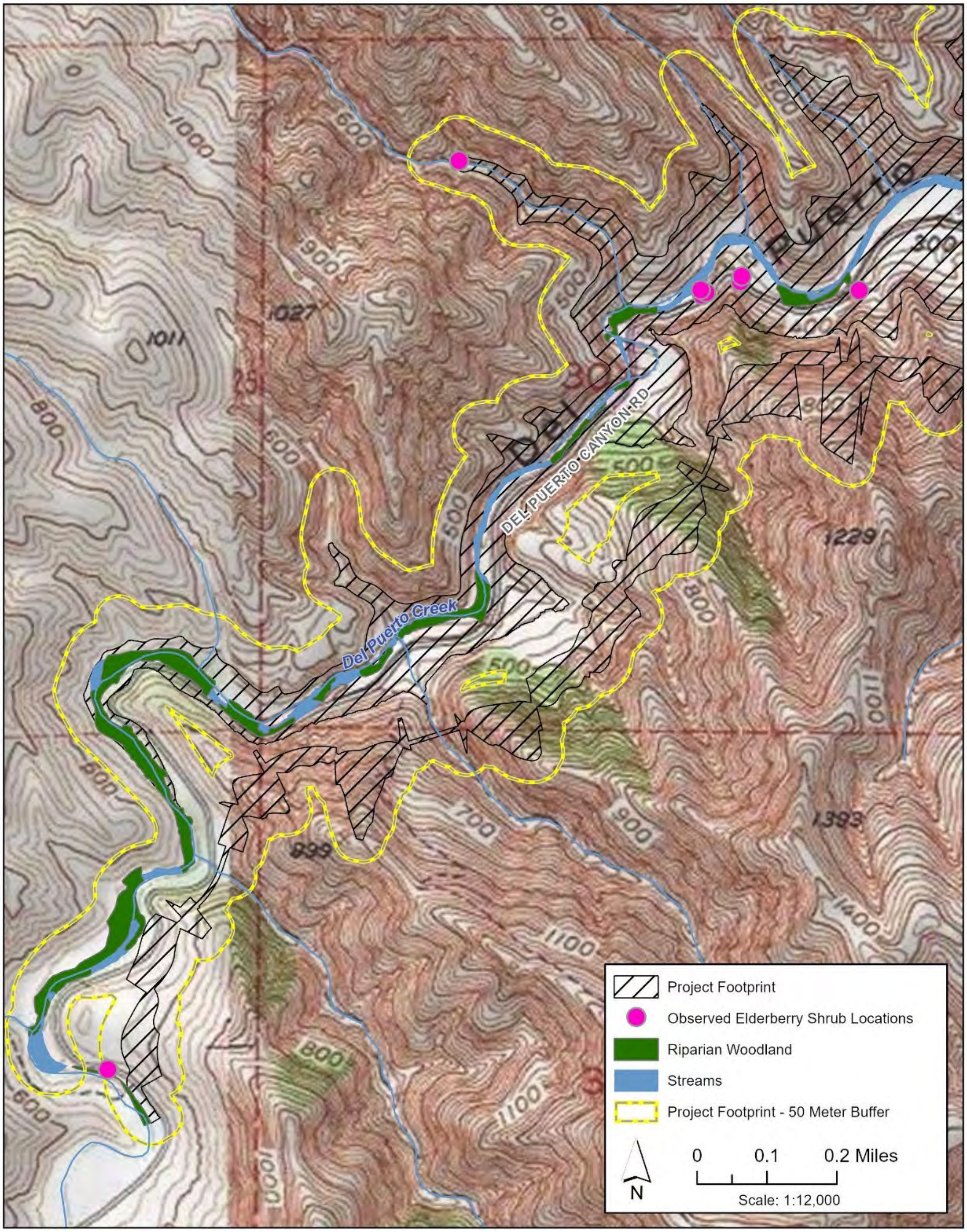
The valley elderberry longhorn beetle is federally listed as threatened. It occurs throughout the Central Valley, from approximately Shasta County to Fresno County, mostly below 500 feet (U.S. Fish and Wildlife Service 2017b). Habitat includes both riparian and non-riparian areas where elderberry shrubs (the host plant) are present. In riparian settings, elderberry shrubs are most common where roots can reach the water table and the shrubs are not inundated for long periods. In non-riparian areas, elderberry occurs in oak woodland and annual grasslands (U.S. Fish and Wildlife Service 2017b).

Valley elderberry longhorn beetle emergence, mating, and egg-laying occurs from March to July, in conjunction with the elderberry flowering season (U.S. Fish and Wildlife Service 2017b). Adult beetles lay eggs on leaves or stem junctions; after hatching, larvae bore into the elderberry stem to pupate and emerge as adults through an exit hole approximately one month later. Presence of an exit hole is the only exterior evidence of the beetle's use of an elderberry shrub (U.S. Fish and Wildlife Service 2017b).

There are no CNDDB occurrences within 5 miles of the study area. The closest CNDDB occurrence is approximately 8 miles northeast of the study area (California Department of Fish and Wildlife 2019b).

ICF biologists surveyed for the valley elderberry longhorn beetle habitat (elderberry shrubs) by identifying shrubs, searching shrubs for exit holes, and record shrub locations using GPS. Potential habitat for valley elderberry longhorn beetle was identified in riparian woodland in the west portion of the study area where elderberry shrubs are present (**Figure 3.4-2**). Potential valley elderberry longhorn beetle exit holes were observed on one of the shrubs along Del Puerto Creek during the wildlife survey.

Figure 3.4-2: Observed Elderberry Shrubs



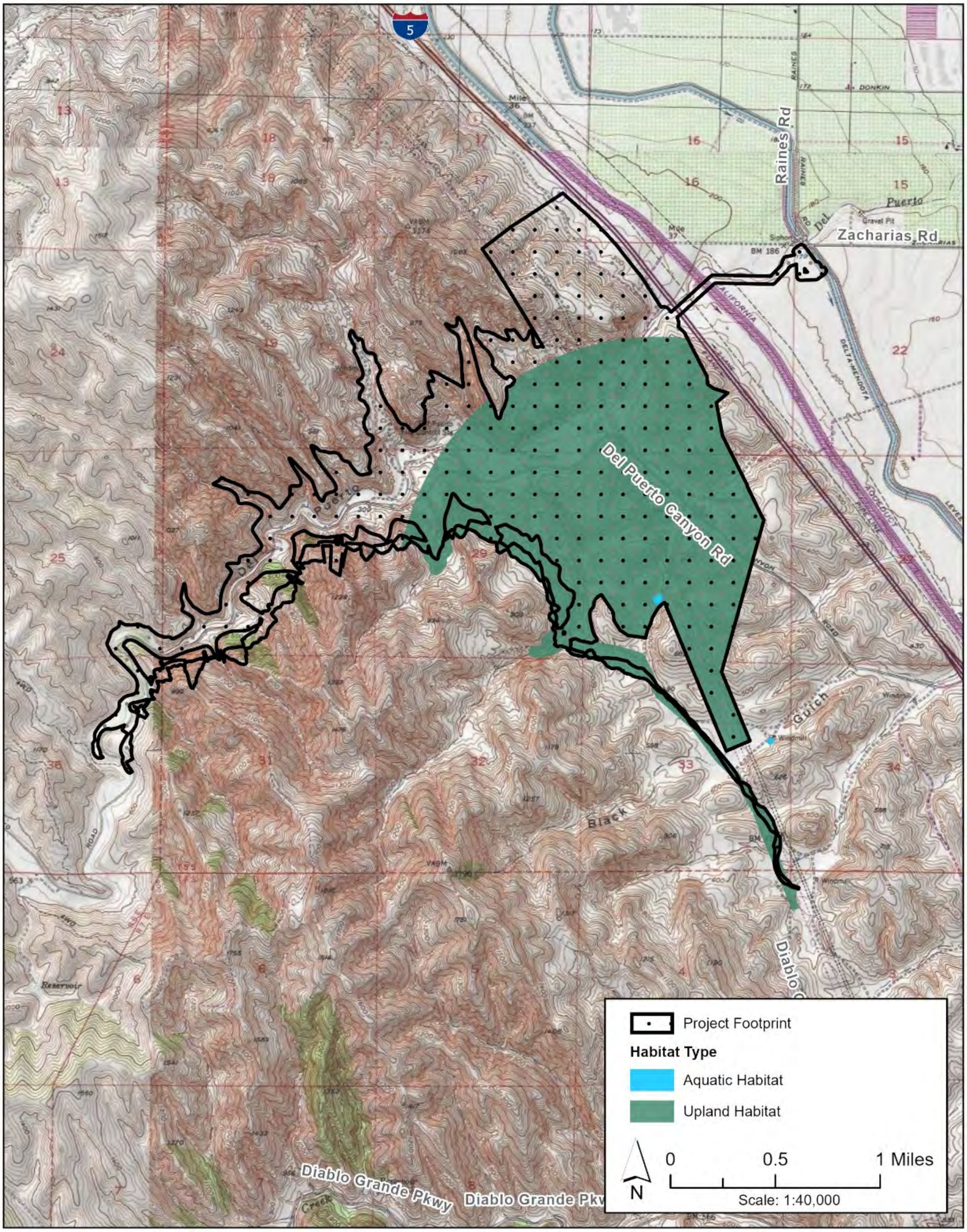
California Tiger Salamander

The California tiger salamander is federally and state listed as threatened. The Central California tiger salamander distinct population segment occurs along the foothills of the Central Valley and Inner Coast Range from San Luis Obispo, Kern, and Tulare Counties, north to Sacramento and Yolo Counties (U.S. Fish and Wildlife Service 2017c). The species inhabits upland habitats most of the year such as annual grasslands and open woodlands that contain small mammal burrows. California tiger salamander breed in vernal pools, as well as in stock ponds and other permanent ponds that usually lack predatory fish or breeding bullfrogs (U.S. Fish and Wildlife Service 2017c). Adults typically migrate to ponds to breed following rainy periods from November to April, and the peak period for metamorphs to leave the natal pond in search of upland habitat occurs from May to July (U.S. Fish and Wildlife Service 2017c).

There are no CNDDB occurrences within 5 miles of the study area. The closest CNDDB occurrence is approximately 8.5 miles northwest of the study area (California Department of Fish and Wildlife 2019b).

ICF biologists surveyed for potential habitat for California tiger salamander, which included estimating the average and maximum depths of aquatic habitat, recording the presence of emergent vegetation, assessing upland habitat for refugia (e.g., ground squirrel and gopher burrows), and assessing barriers to movement. Locations of potential aquatic habitat were recorded using GPS and the limits were mapped as part of the wetland delineation. Potential aquatic habitat identified in the study area is limited to a stock pond just west of the existing utilities corridor (**Figure 3.4-3**). Per USFWS and CDFW guidelines, annual grasslands within 1.24 miles of aquatic habitat can be used as upland habitat (U.S. Fish and Wildlife Service and California Department of Fish and Game 2003).

Figure 3.4-3: California Tiger Salamander Habitat



California Red-legged Frog

The California red-legged frog is federally listed as threatened and a California species of special concern. The historical range of California red-legged frog generally extends south along the coast from the vicinity of Point Reyes National Seashore, Marin County and inland from the vicinity of Redding, Shasta County, southward along the interior Coast Ranges and Sierra Nevada foothills to northwestern Baja California, Mexico (Storer 1925; Jennings and Hayes 1985). The current range is generally characterized based on the current known distribution. Although California red-legged frog is still locally abundant in portions of the San Francisco Bay area and the central coast, only isolated populations have been documented elsewhere within the species' historical range, including the Sierra Nevada, northern Coast Ranges, and northern Transverse Ranges (USFWS 2017a). California red-legged frog is believed to be extirpated from the floor of the Central Valley (USFWS 2002).

California red-legged frog inhabit marshes, streams, lakes, ponds, and other, usually permanent, sources of water that have dense riparian vegetation (Stebbins, 2003). California red-legged frog primarily breeds in ponds and less frequently in pools within streams (Thomson et al., 2016). Breeding occurs from November through April, and red-legged frogs typically lay their eggs in clusters around aquatic vegetation (USFWS, 2002). Larvae undergo metamorphosis from July to September, 3.5 to 7 months after hatching (66 FR 14626).

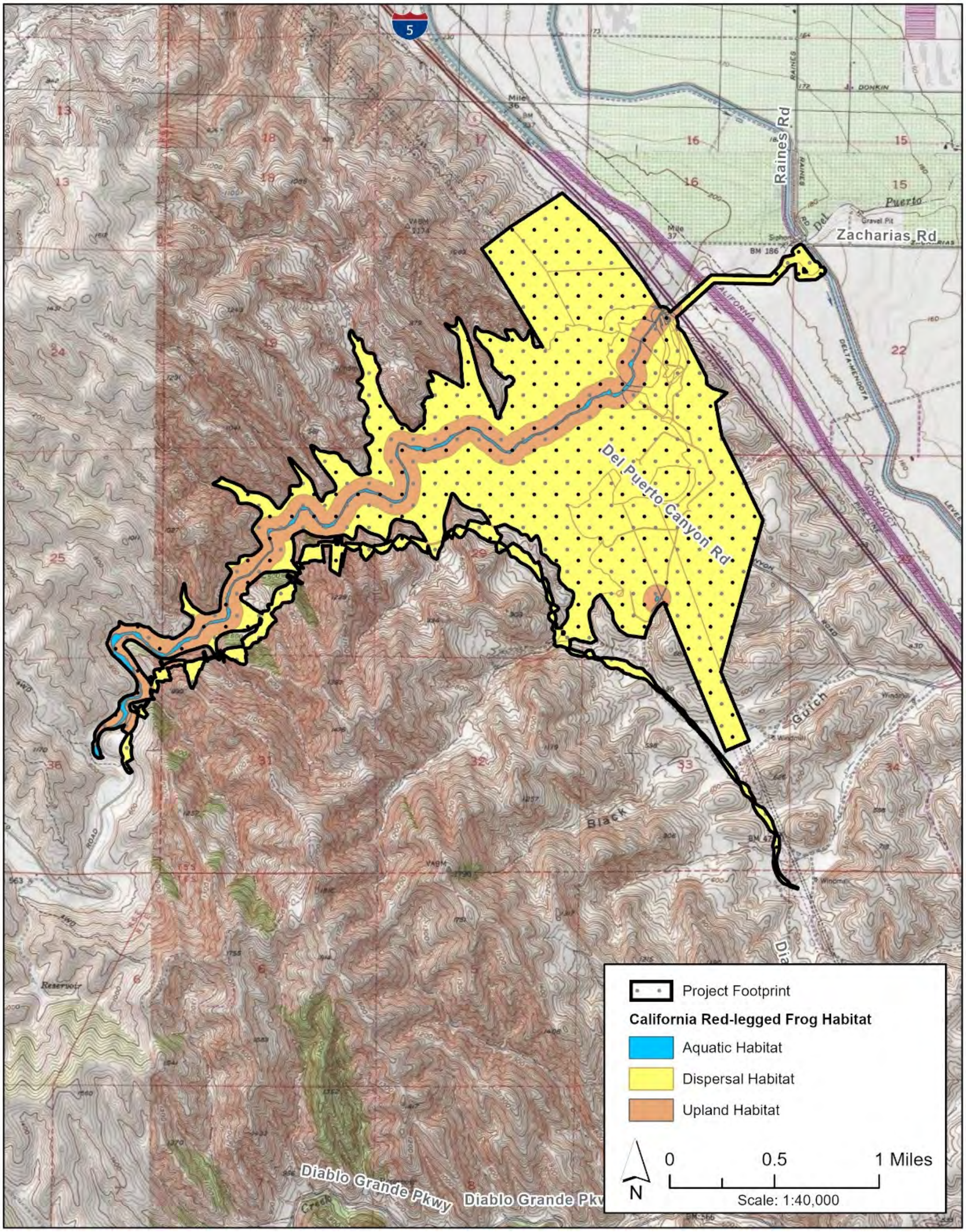
California red-legged frogs often disperse from breeding sites to various aquatic, riparian, and upland estivation habitats during the summer (66 FR 14628); however, it is common for individuals to remain in the breeding area year-round (66 FR 14628; Bulger et al. 2003; Fellers and Kleeman 2007). Adults may take refuge during dry periods in rodent holes or leaf litter in riparian habitats (USFWS, 2002). Within riparian areas, microhabitats utilized by California red-legged frogs include blackberry thickets, logjams, and root tangles (Fellers and Kleeman 2007).

California red-legged frogs travel through a variety of upland habitat types (e.g., grassland, riparian, woodlands) to reach breeding and nonbreeding sites, upland refugia and foraging habitats, or new breeding locations (Bulger et al. 2003; Fellers and Kleeman 2007). Frogs typically travel much shorter distances between aquatic and upland refugia and foraging habitats than when dispersing between breeding and nonbreeding aquatic habitats (Bulger et al. 2003). In one study, 90 percent of radio-tagged California red-legged frogs that did not make overland movements (i.e., non-migrating frogs) were found within 200 feet (60 meters) of aquatic habitat throughout the year; the farthest movement was 427 feet (130 meters) from water and was in response to summer rain (Bulger et al. 2003). In another study, a radio-tagged California red-legged frog moved at least 0.9 mile (1 kilometer) and up to 1.7 mile (2.8 kilometers) over several months during the breeding season (Fellers and Kleeman 2007).

There are no CNDDB occurrences within 5 miles of the study area. The closest occurrences are 14.75 miles west and 15 miles south of the study area (California Department of Fish and Wildlife 2019b).

ICF biologists surveyed for potential habitat for California red-legged frog, which included estimating the average and maximum depths of aquatic habitat, recording the presence of emergent vegetation, assessing upland habitat for refugia (e.g., ground squirrel and gopher burrows), and assessing barriers to movement. Locations of potential aquatic habitat were recorded using GPS and the limits were mapped as part of the wetland delineation. Potential aquatic habitat for California red-legged frog is present in the large pond and in Del Puerto Creek **(Figure 3.4-4**). For the purposes of identifying potentially suitable upland habitat, a 300-foot area around potential aquatic habitat was used to define where frogs may occupy upland habitats for foraging and cover at any time of year, a distance that is based upon the studies done by Bulger et al. (2003). Dispersal habitat includes grasslands within 1 mile of potential aquatic habitat. Although movements could occur at any time of year, considering the drier climate during the summer and fall in the action area as compared to Marin County, where Fellers and Kleeman (2007) conducted their study, dispersal is most likely to occur during the rainy season, generally October 15 to March 31.

Figure 3.4-4: California Red-legged Frog Habitat



Foothill Yellow-legged Frog

The foothill yellow-legged frog is a candidate for state listing as threatened and is a California species of special concern. Historically the species occurred from the Willamette River drainage in Oregon west of the Sierra-Cascade crest to at least the San Gabriel River drainage in Los Angeles County, as well as in a disjunct population at 6,700 feet in Baja California. In California the species has been reported from foothill and mountain streams in the Klamath, Cascade, Sutter Buttes, Coast, Sierra Nevada, and Transverse ranges from sea level to around 6,000 feet. Foothill yellow-legged frog inhabits rivers and streams in hardwood, conifer, and valley-foothill riparian forests, mixed chaparral, and wet meadows. Habitat is generally characterized as partly-shaded, shallow perennial rivers and streams with a low gradient and rocky substrate that is at least cobble-sized; however, they have also been known to occupy intermittent and ephemeral streams by post-metamorphic frogs and small impoundments, isolated pools in intermittent streams, and meadows along the edge of streams. Breeding sites in rivers and streams are often located near the confluence of tributary streams in sunny, wide shallow reaches. Tadpoles require slow, stable flows during development. Post-metamorphic frogs remain close to the water's edge (average <10 ft), select sunny areas with limited canopy cover, and are often associated with riffles and pools. Adequate water, food resources, cover from predators, ability to regulate their body temperature (e.g., presence of basking sites and cool refugia), and absence of non-native predators are important components of non-breeding habitat. During the winter months they typically move away from larger streams and rivers to avoid high flows, usually inhabiting smaller tributaries or taking cover in adjacent vegetation on the stream or river. They have also been observed using upland habitats at an average distance from the stream of about 234 feet though have been reported moving as far as 2,723 feet from a river. The species can be active both day and night. (California Department of Fish and Wildlife 2019e)

There are four CNDDB occurrences within 5 miles of the study area, with the closest occurrence on the southwestern boundary of the study area (California Department of Fish and Wildlife 2019b). Potential habitat for foothill yellow-legged frog is present in Del Puerto Creek and adjacent riparian woodlands and riparian wetlands in the study area.

Swainson's Hawk

The Swainson's hawk is state listed as threatened. The species occurs in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Desert (Zeiner et al. 1990). Swainson's hawks nest in riparian habitats or isolated roadside trees adjacent to foraging habitat. Preferred nest trees include valley oaks, Fremont's cottonwood, willows, sycamores, and walnuts (California Department of Fish and Game 1994). Foraging occurs in adjacent grasslands, pastures, alfalfa, and grain fields (Zeiner et al. 1990). Swainson's hawks migrate to California to establish nesting territories in early March (California Department of Fish and Game 1994). Nests are a platform composed of sticks, bark, and leaves, in a tree, bush, or utility pole, typically 4-100 feet above the ground (Zeiner et al. 1990).

There are two CNDDB occurrences within 5 miles of the study area, with the closest occurrence inside the study area (California Department of Fish and Wildlife 2019b). Swainson's hawks were observed in the study area during surveys in May and July of 2019. Potential nesting habitat for Swainson's hawk includes riparian woodland and ornamental trees and potential foraging habitat includes annual grassland.

Golden Eagle

The golden eagle is a California fully protected species. The species occurs in foothills and mountains throughout California below 11,500 feet; it can be found in the nonbreeding season in lowlands such as the Central Valley. Golden eagles forage on lagomorphs, rodents, and other mammals, birds, and reptiles in grasslands, deserts, savannahs, and early successional forest and shrub habitats (Zeiner et al. 1990). Golden eagles nest primarily on cliffs and escarpments at any height, or in large trees in open areas. Nests are large platforms composed of sticks, twigs, and greenery. Peak breeding occurs from late January through August, with peak breeding from March through July (Zeiner et al. 1990).

There are no CNDDB occurrences within 5 miles of the study area. The closest CNDDB occurrence is approximately 10.5 miles south of the study area (California Department of Fish and Wildlife 2019b). Studies by others indicate that there are golden eagle nesting territories within 5 miles of the study area (Wiens et al. 2015, Hunt et al. 2017 and Dunk et. al. 2019). Potential foraging habitat for golden eagle is present in the study area and the species was observed in flight during the wildlife surveys. Potential nesting habitat occurs to the west of the study area where there are cliffs and escarpments, as well as where there are trees within the study area.

White-tailed Kite

White-tailed kite is a California fully protected species. The species occurs in lowland areas west of the Sierra Nevada from the Sacramento Valley to western San Diego County. It is usually found near agricultural areas (Zeiner et al. 1990). White-tailed kites forage primarily on small mammals in open grasslands, farmlands, and emergent wetlands. Nests are located near the top of dense oak, willow, or other tree stand r5s, typically 20-100 feet above the ground, and are composed of loosely piled sticks and twigs (Zeiner et al. 1990). Breeding occurs from February to October, with peak breeding from May to August.

There are no CNDDB occurrences within 5 miles of the study area. The closest CNDDB occurrence is approximately 21 miles from the study area (California Department of Fish and Wildlife 2019b). Potential nesting habitat for white-tailed kite is present in riparian woodland and ornamental trees in the study area and potential foraging habitat is present in grassland throughout the study area.

Tricolored Blackbird

Tricolored blackbird is state listed as threatened. The species occurs primarily within the Sacramento and San Joaquin Valleys and Sierra Nevada foothills, but can also be found along the coast and inland areas of southern and central California (U.S. Fish and Wildlife Service 2019b). Tricolored blackbirds forage in croplands, grasslands, flooded land, and pond edges (Zeiner et al. 1990). They nest in dense colonies in emergent marsh vegetation (such as cattails and tules) or upland sites with blackberries, nettles, thistles, and grain fields. Nest sites must be able to support a colony of at least 50 pairs (Zeiner et al. 1990). The breeding season for tricolored blackbird typically lasts from mid-April through July (Zeiner et al. 1990).

There are three CNDDB occurrences within 5 miles of the study area, with the closest occurrence approximately 1.5 miles southeast of the study area (California Department of Fish and Wildlife 2019b). The study area does not support tricolored blackbird nesting habitat; however, potential foraging habitat is present in grasslands throughout the study area.

San Joaquin Kit Fox

The San Joaquin kit fox is federally listed as endangered and state listed as threatened. The species historically occurred in semi-arid habitats of the San Joaquin Valley and in arid grassland of the adjacent foothills from as far north as Tracy, San Joaquin County and La Grange, Stanislaus County, south to Kern County (U.S. Fish and Wildlife Service 2010). The current range of the species extends from Kern County in the south to Contra Costa and Alameda counties in the north, as well as the Carrizo Plains in eastern San Luis Obispo County (U.S. Fish and Wildlife Service 2010). The northern range for the species consists of a narrow band of habitat along the western edge of the San Joaquin Valley from the San Luis Reservoir in western Merced County north to central Alameda and Contra Costa counties (Cypher et al. 2013). San Joaquin kit fox observations in the northern range are rare and no populations are known to be present (Cypher et al. 2013). The northern part of the range is characterized by highly fragmented medium suitability habitat consisting primarily of dense grasslands dominated by wild oats, which may not be sufficient to sustain persistent populations of kit fox (Cypher et al. 2013).

Optimal habitats for San Joaquin kit foxes are generally arid shrublands and grasslands, characterized by sparse or no shrub cover, sparse ground cover with patches of bare ground, short vegetative structure (herbaceous vegetation <18 inches tall), and sandy to sandy-loam soils (Cypher et al. 2007). Kit foxes have been shown to be strongly linked to areas where kangaroo rats are abundant (Cypher et al. 2007). Kit foxes generally avoid steep terrain; slopes under 5 percent are optimal for kit foxes, and slopes greater than 15 percent are unsuitable (Cypher et al. 2007). Tall and dense vegetation is less optimal because it creates conditions that make it difficult for kit foxes to detect approaching predators or to capture prey (Cypher et al. 2007). Kit foxes have also been observed to forage in orchards; however, use would depend on an open understory to facilitate predator detection (Cypher et al. 2007).

Based on studies conducted in areas of highly suitable habitat, the average home range size for San Joaquin kit fox is approximately 1,344 acres (Cypher et al. 2013). Den ranges (roughly equivalent to home ranges) of kit foxes in the Los Banos Valley averaged 1,169 acres and ranged from 212 acres to 3,104 acres (Constable et al. 2009).

There are four CNDDB occurrences within 5 miles of the study area, with the closest occurrence inside the study area (California Department of Fish and Wildlife 2019b). The occurrence within the study area was reported in 1973 as being near the mouth of Del Puerto Canyon (California Department of Fish and Wildlife 2019b). The next nearest CNDDB occurrence is approximately 1.5 miles southeast of the study area, which was reported as roadkill on the west side of I-5 in 2004 (California Department of Fish and Wildlife 2019b). There is also an occurrence that is 2.25 miles to the north of the study area that was reported as a road mortality in 1990 and was found in the median of I-5.

ICF biologists assessed the study area for potential habitat for San Joaquin kit fox, which included surveying low lying areas for potential kit fox dens (burrows between 5 to 8 inches in diameter). Between 2 and 4 staff walked low lying areas at approximately 30-foot spaced intervals walking parallel transects and recording all potential dens using GPS.

A San Joaquin kit fox habitat model developed by Cypher et al. (2013) identified areas of medium and high habitat suitability across the species range. The GIS dataset that was produced for this study was obtained from the U.S. Bureau of Reclamation for use in considering the project’s location relative to this range wide model. As seen in **Figure 3.4-5**, the portion of Stanislaus County within which the study area lies has fragmented, narrow areas of low to moderate or moderate to high quality habitat from the Sperry ~~Road~~ Avenue/Diablo Grande Parkway – I5 Interchange north to around the Stanislaus County line. Though this data is not to be interpreted at the project level, it does emphasize the general lack of suitable San Joaquin kit fox habitat in this region and that this portion of the species range may only serve as a narrow dispersal corridor between areas north and south.

Potentially suitable habitat for San Joaquin kit fox in the study area includes annual grasslands in the areas with slopes less than 15 percent, which is depicted in **Figure 3.4-6.** The area depicted in this figure totals 269 acres, which would be on the low end of previously reported home ranges and with the one large contiguous piece in the valley along Del Puerto Creek totaling approximately 130 acres it is unlikely to provide sufficient area for a kit fox home range. The grasslands in the study area were observed to be relatively dense and lacked areas of open bare ground. The annual grasslands were observed with numerous ground squirrel burrows but no kangaroo rat colonies. The grassland areas were also surveyed for potential dens (burrows ranging between 5 to 8 inches in diameter), which resulted in the mapping of 115 burrows within this size range. Nearly all of these burrows were observed to be occupied by ground squirrels and several had signs of badger digging. No San Joaquin kit fox were observed in the study area and no sign of their presence was detected during the surveys (e.g., scat, prey remains, characteristic keyhole shaped burrow entrance). Trail cameras that were placed out for a total of two weeks in mid to late June 2019 near the mouth of Del Puerto Canyon did not detect San Joaquin kit fox.

Based on the background information presented above and the results of the reconnaissance level surveys, the study area represents low quality habitat for San Joaquin kit fox though it may be used as a dispersal corridor between more suitable habitat to the south and areas to the north.

Figure 3.4-5: ESRP San Joaquin Kit Fox Habitat Suitability

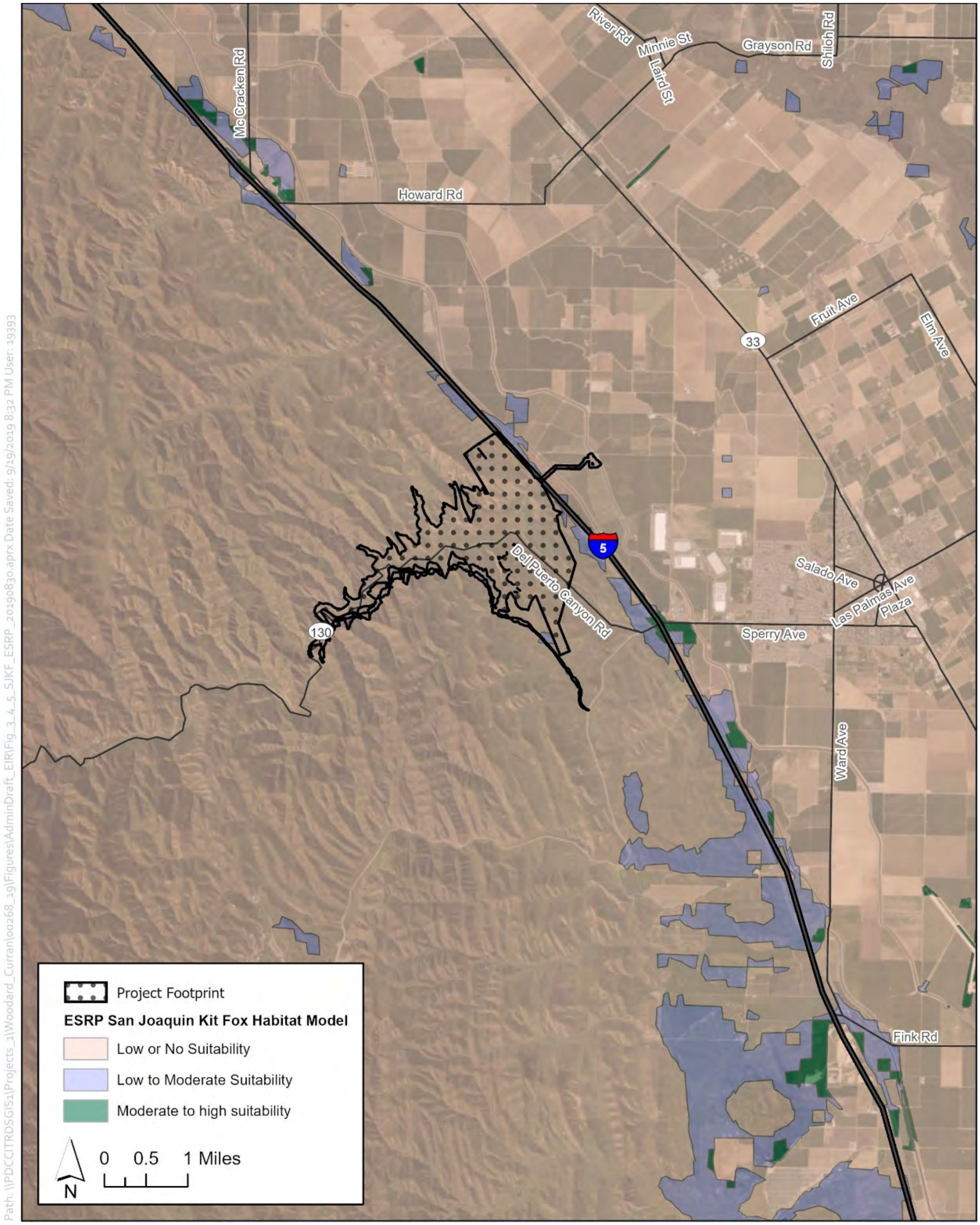
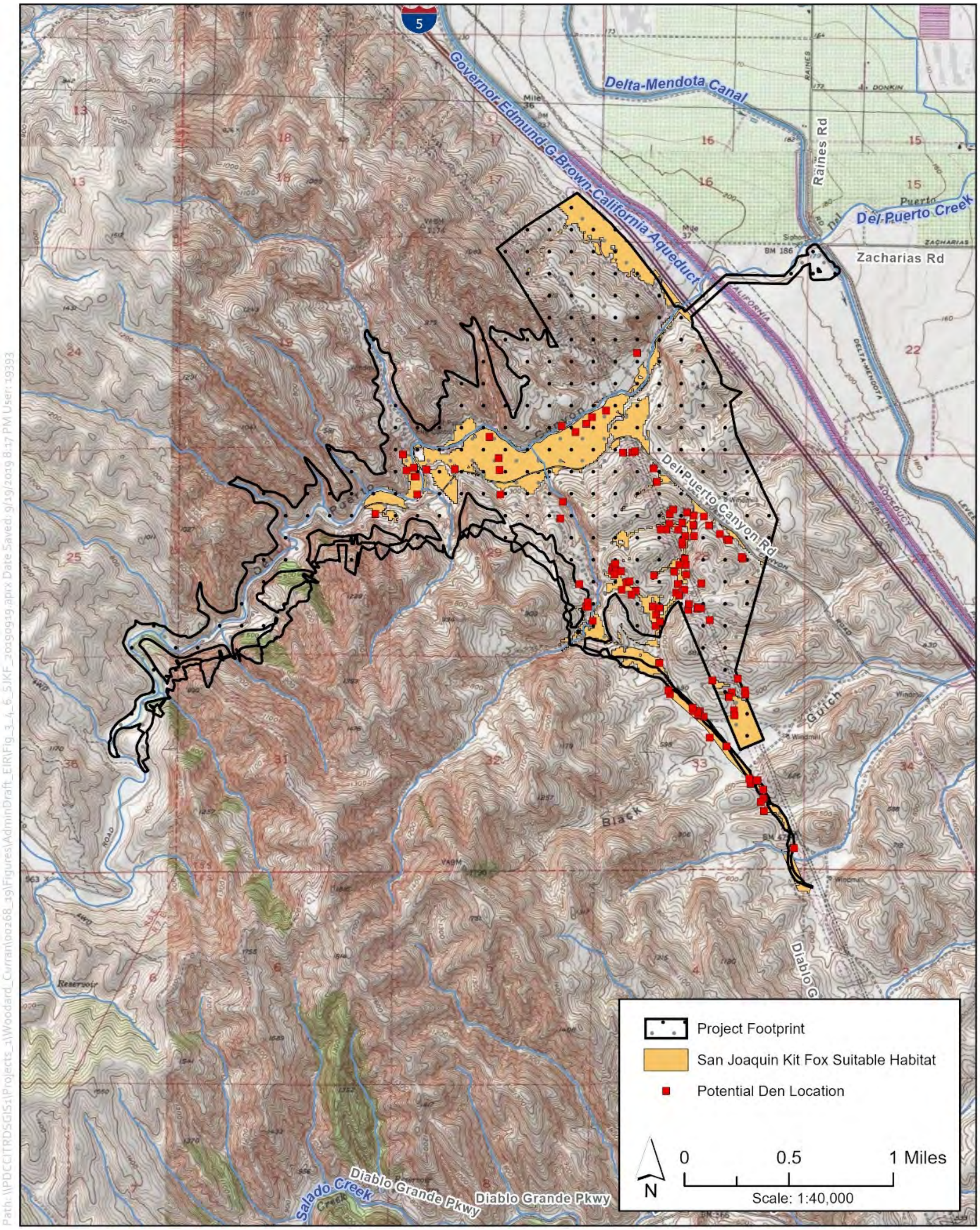


Figure 3.4-6: San Joaquin Kit Fox Habitat



Wildlife Corridors

Wildlife corridors are landscape features that facilitate the connectivity and movement of wildlife between two or more habitat areas (Soule and Gilpin 1991; Beier and Loe 1992). Connectivity of wildlife populations and habitats is critical for the conservation of plant and animal species and wildlife and habitat connectivity are important elements of a landscape's ecological value and function. Wildlife corridors are important because they facilitate habitat and population connectivity, species movement, seasonal migration, and dispersal, genetic interchange, and access to food, shelter, and other resources. Regional and local scale corridors and habitat areas that facilitate wildlife movement and connectivity exist within the project footprint and project vicinity.

The area surrounding and within the study area provides opportunity for local movement and landscape-scale connectivity for a wide variety of species including invertebrates, reptiles, amphibians, birds, and small and medium mammals (see Appendix B2, *Species Observed in the Study Area*, for a full list of flora and fauna observed during field studies). A variety of landscape features and habitats in the region provide structure and function that facilitate the movement of a wide variety of species, including drainages, canyons, riparian and stream corridors, wetlands, gentle terrain, grasslands, scrublands, woodlands, and agriculture areas. The areas to the west of I-5 contain relatively low levels of human development and high levels of habitat connectedness and open space. These conditions provide live-in habitat and home ranges for a number of species and also provide relatively high-quality value and function for local wildlife movement and habitat connectivity in the region. Live-in habitat is important for connectivity, especially for species that have low mobility and have small home ranges (e.g., low mobility invertebrates, amphibians, reptiles) as they depend on the gradual movements through multiple generations dispersing small distances to disperse to new areas and connect to larger metapopulations (i.e., spatially separated local populations across a larger region) to exchange genetic material. Several areas identified as important connectivity habitat and as wildlife corridors exist within and adjacent to the study area and are discussed in detail below.

San Joaquin Valley Wildlife Corridors

Various California State agencies are collaborating to improve planning information for wildlife connectivity to identify potential corridors in the San Joaquin Valley region connecting conservation opportunity areas. The collaboration has considered multiple variables, including current land cover and management, road density, urban area density, natural area density, and waterway density for forest, open/shrub, and aquatic/riparian habitats. Using this information, a value was then assigned to a patch of land that is then used to link similarly valued lands to create potential wildlife corridors. The study area is located adjacent to several areas identified as corridors within the San Joaquin Valley including a large corridor located about 1 mile west of the western end of the study area (**Figure 3.4-7**).

UC Davis Core Reserves and Corridors

UC Davis ecologists (Huber et al. 2010) looked at current conservation planning efforts at local and regional scales and proposed a regional conservation network to link areas planned for conservation. The study area lies within an area identified as a corridor by the UC Davis study (**Figure 3.4-8**). The overlapping corridor encompasses the flats and foothills west of I-5 as well as swaths of land that connect core reserve lands to the north and south of the proposed project area.

Figure 3.4-7: San Joaquin Valley Wildlife Corridors

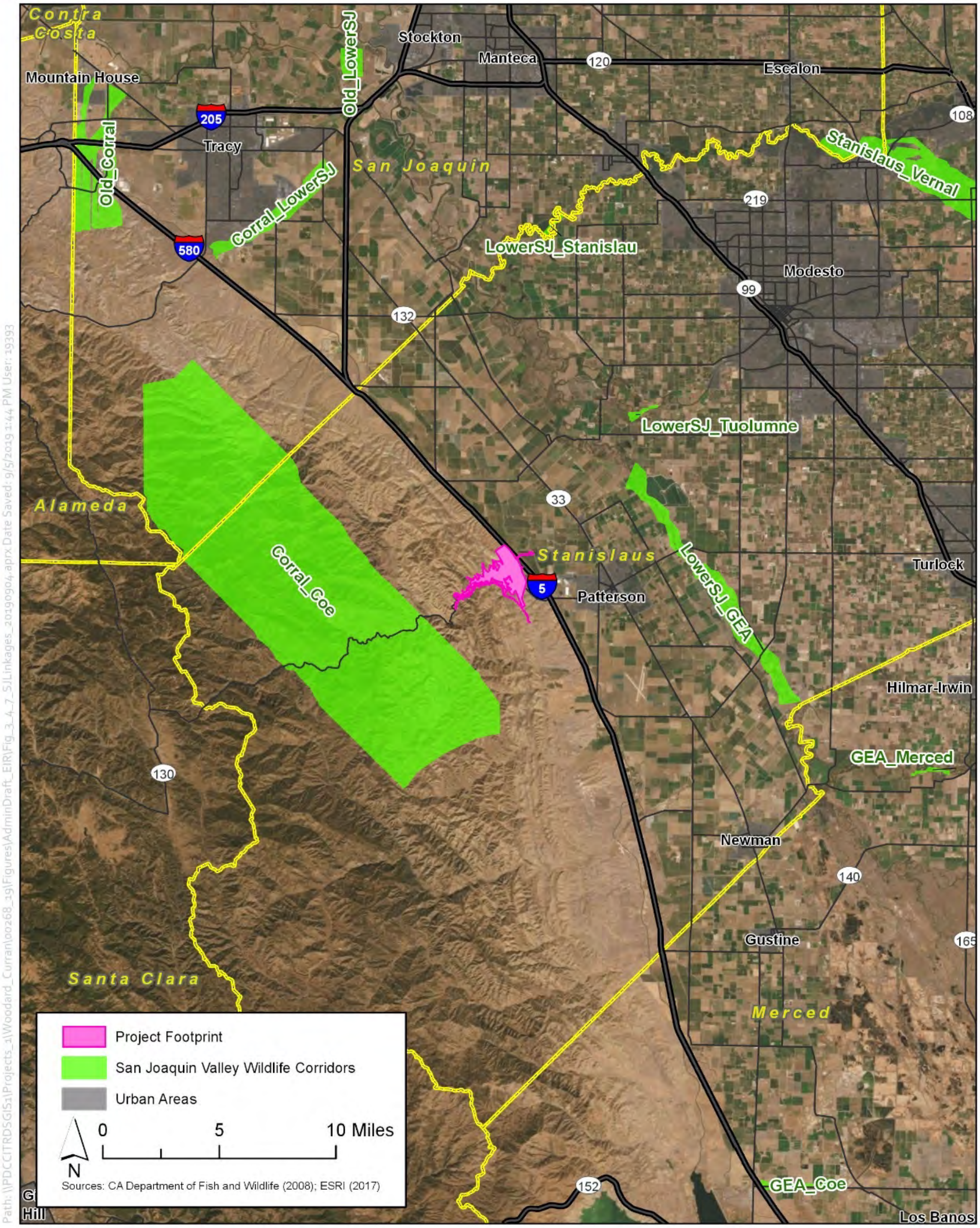
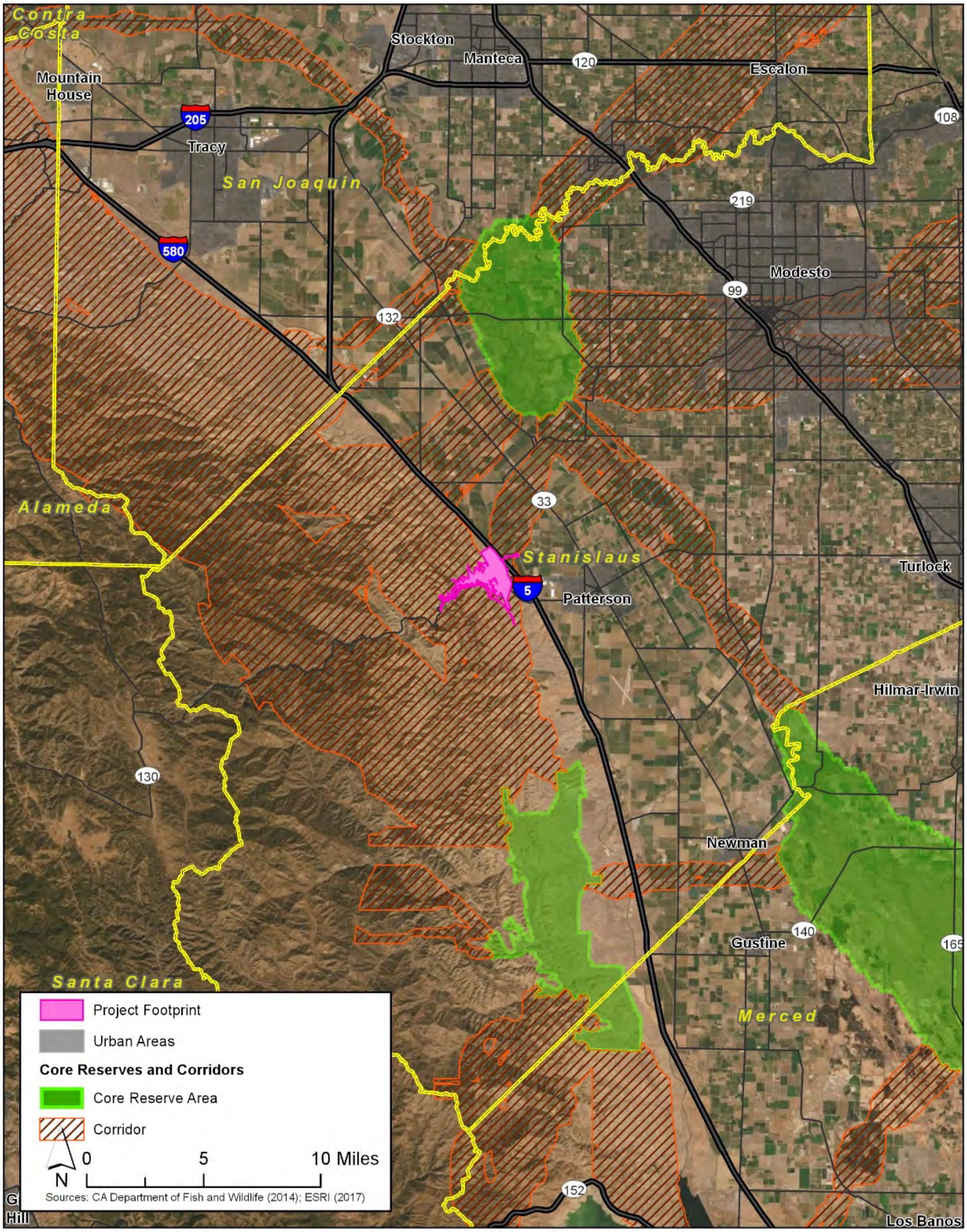


Figure 3.4-8: Core Reserves and Corridors - UC Davis



ACE program Connectivity Ranking

CDFW Areas of Conservation Emphasis (ACE) is a compilation and analysis of the best-available statewide spatial information in California on biodiversity, rarity and endemism, harvested species, significant habitats, connectivity and wildlife movement, climate vulnerability, climate refugia, State Wildlife Action Plan (SWAP), stressors, and land ownership (Hill et al. 2015). ACE addresses both terrestrial and aquatic data. The ACE model combines and analyzes terrestrial information in a 2.5 square mile hexagon grid and aquatic information at a watershed level [hydrologic unit code (HUC) level 12] across the state to produce a series of maps for use in non-regulatory evaluation of conservation priorities in California. The model addresses as many of CDFWs statewide conservation and recreational mandates as feasible using high quality data sources. High value areas statewide and in each USDA Ecoregion were identified.

The Terrestrial Connectivity dataset is one of the four key components of the CDFW ACE suite of terrestrial conservation information along with terrestrial Biodiversity, Significant Habitats, and Climate Resilience. The Terrestrial Connectivity dataset summarizes information on terrestrial connectivity by ACE hexagon including the presence of mapped corridors or linkages and the juxtaposition to large, contiguous, natural areas. This dataset was developed to support conservation planning efforts by allowing users to spatially evaluate the relative contribution of an area to terrestrial connectivity based on the results of statewide, regional, and other connectivity analyses.

The study area overlaps with a large contiguous area of ACE hexagons with a Connectivity Rank of 4 (with a rank of 1 being the lowest and 5 being the highest) and is surrounded by contiguous hexagons with high Connectivity Ranks (**Figure 3.4-9**). Connectivity Ranks are higher west of I-5 and highest within and adjacent to study area.

Bay Area and Beyond Critical Linkages

The Critical Linkages: Bay Area and Beyond effort (Penrod et al. 2013) was led by SC Wildlands, a nonprofit focused on connectivity conservation within the Bay Area and areas adjacent, which overlaps with a portion of the study are. SC Wildlands prepared a report that identifies 14 landscape level connections that combined with the Conservation Lands Network produces a comprehensive plan for regional scale connectivity. The areas designated are considered crucial to the ecological health of the region. The 14 linkages were identified by experts in the multidisciplinary fields related to conservation biology and modeling. The study uses several spatial analyses to identify movement routes between target areas for different species, and a least-cost corridor analysis, which is an analysis that identifies the optimal route (linkage), was applied to model efficient paths based on weighted characteristics. In total, 11 focal species were chosen for modeling the optimal routes for linking habitats. Linkages were designed based on habitat suitability, patch size and patch configuration analysis, as well as opinion given by species experts. These linkage designs were then field checked for barriers and areas of priority. The report offers a method for designing a conservation strategy and identifying opportunities for conserving linkages.

The study area overlaps with a both a linkage and a Landscape Block identified by the Bay Area and Beyond Critical Linkages analysis (**Figure 3.4-10**). The overlapping linkage runs north-south west of I-5 and connects a large landscape block within this area and encompassing the Diablo Range which is also connected to other linkages in the larger landscape.

Figure 3.4-9: CDFW ACE Connectivity

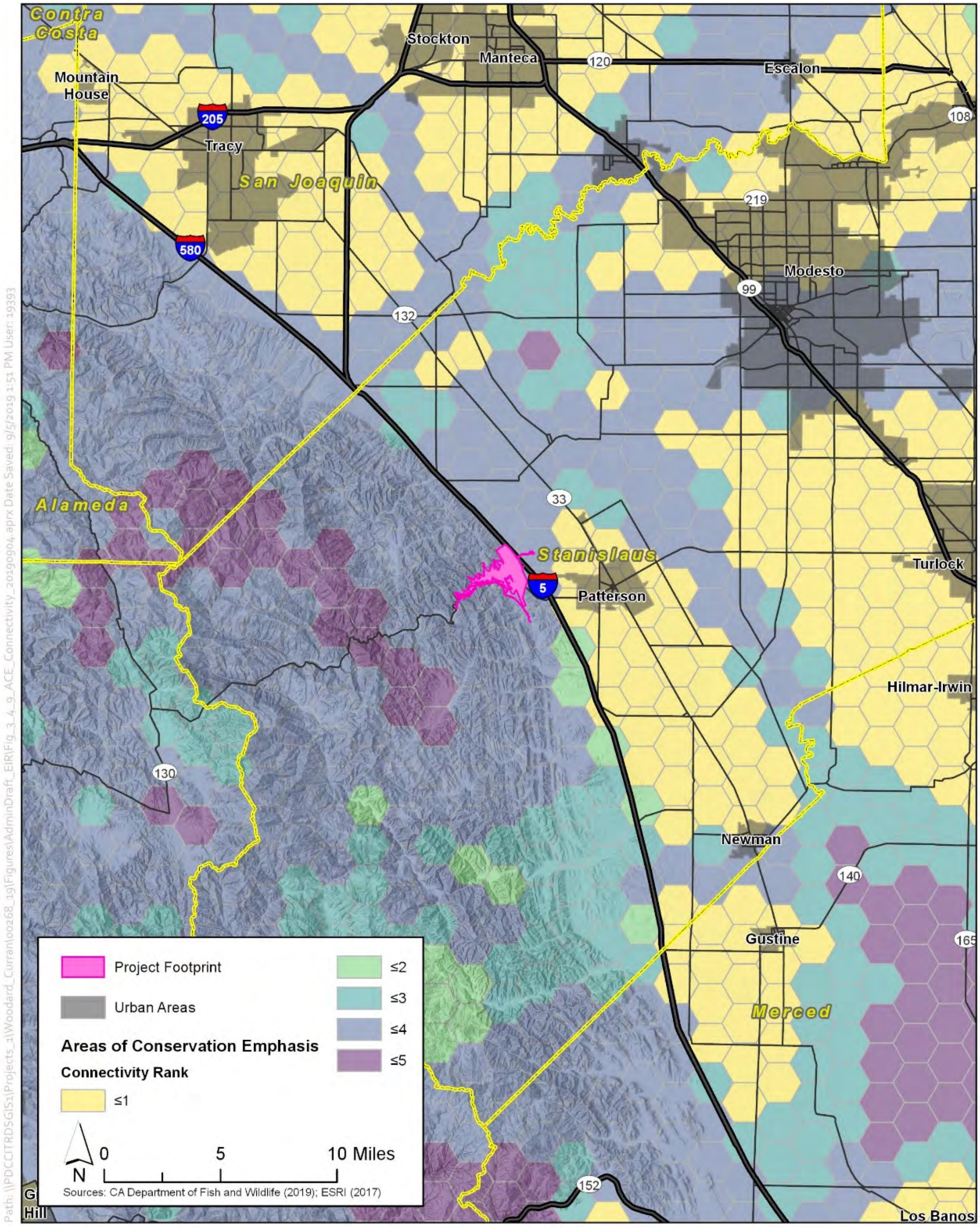
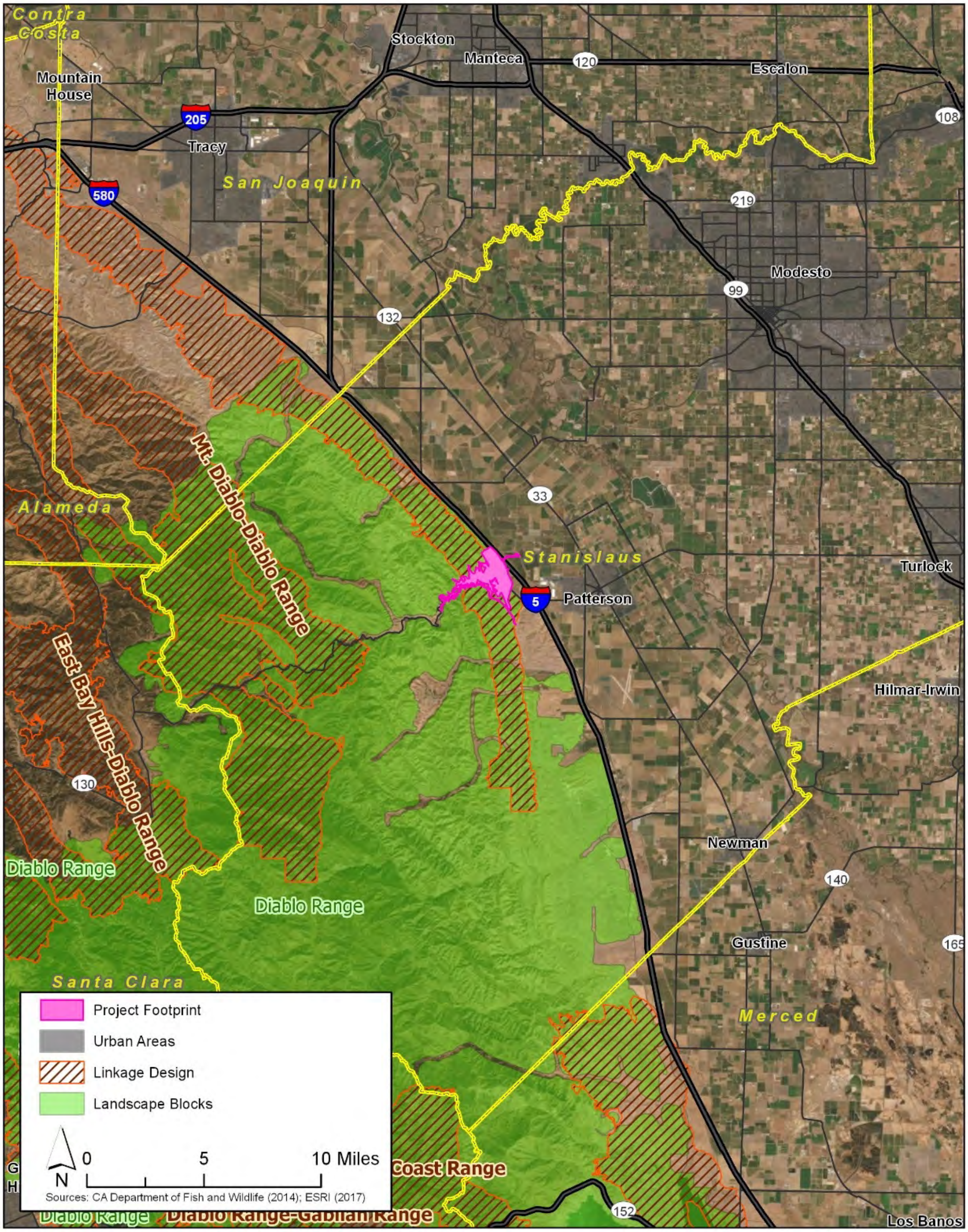


Figure 3.4-10: Bay Area Critical Linkages

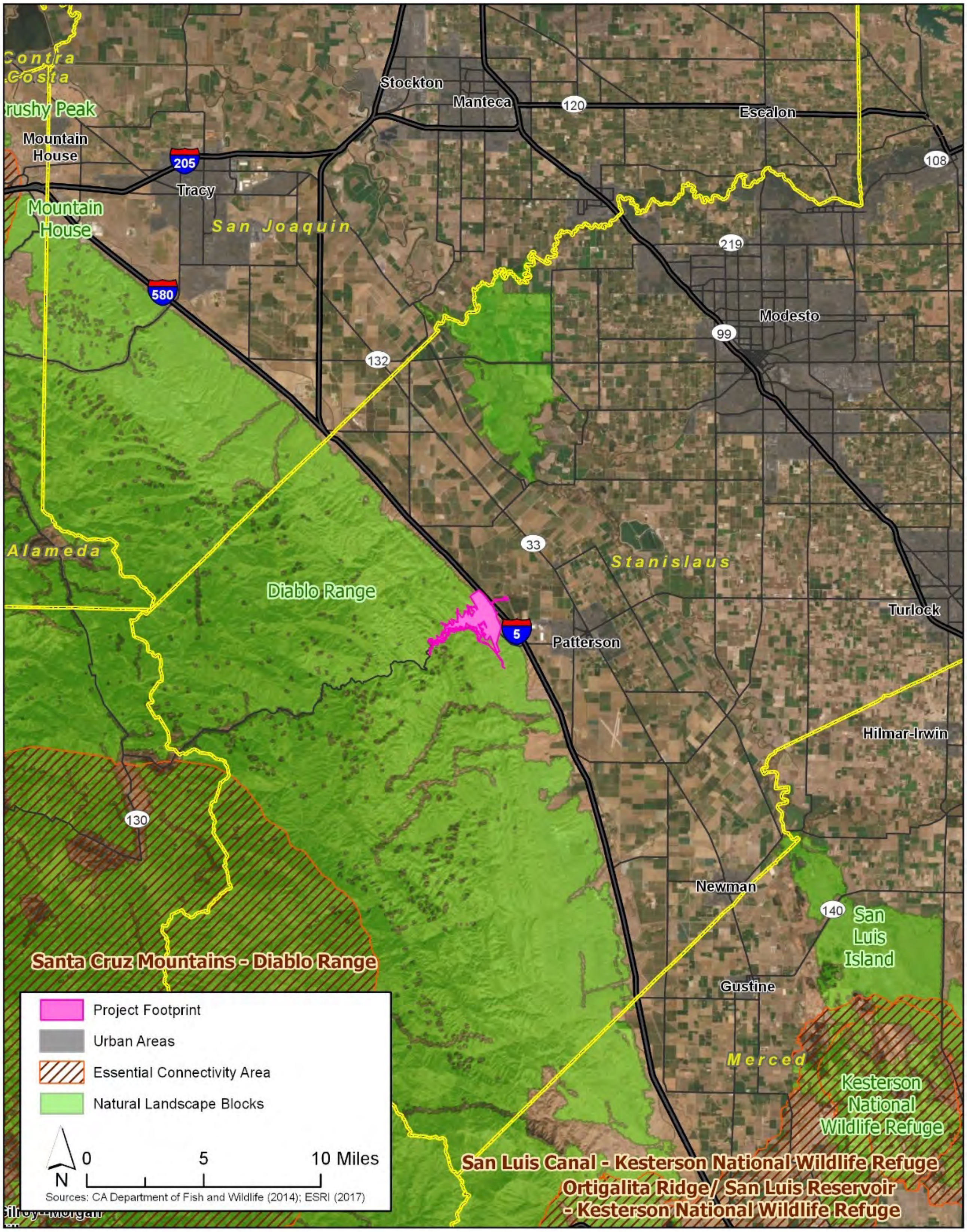


California Essential Habitat Connectivity Project Data

The California Essential Habitat Connectivity Project (CEHC) (Spencer et al. 2010) was designed to support land-use planning and transportation. The report was produced by a multidisciplinary team made up of 62 agencies, a smaller Technical Advisory Team and a Steering Committee. The Report includes a statewide Essential Habitat Connectivity Map, the data collected to delineate the areas shown on the map, recommendations for correcting the fragmentation caused by road, and guidance for developing and implementing local and regional connectivity plans. The ecological impacts of road networks were assessed using guidelines found in the report. There was an analysis conducted on where mitigation will be most effective and how best to enhance connectivity while lessening vehicle wildlife collisions.

The map created depicts areas that are large natural blocks of habitat and areas deemed essential for ecological connectivity of a broad range of species. The Essential Connectivity Areas were found by identifying optimal routes for linking habitats and are just large polygons that need to be replaced by more refined Linkage Designs. The Natural Landscape Blocks and Essential Connectivity Areas can be used to help prioritize conservation, mitigation or other land-based decisions (Spencer et al. 2010). A portion of the Great Central Valley Ecoregion falls within the study area. This region mainly consists of agriculture and urban development with natural lands severely reduced. Many of the species in this region are of high conservation priority. The study area overlaps with identified Natural Landscape blocks and lies to the east of local connectivity areas (**Figure 3.4-11**). According to the CEHC, “Restoring and enhancing connectivity for such species, as well as for aquatic and riparian species, is a high conservation priority in the region.” The major conservation challenges of this region include high level of habitat loss and conversion and subsequent habitat fragmentation.

Figure 3.4-11: California Essential Habitat Connectivity Regional Corridors



Migratory Birds

Non-special-status migratory birds have the potential to nest in the study area. Although these species are not considered special-status wildlife species, their occupied nests and eggs are protected by California Fish and Game Code Sections 3503 and 3503.5 and the Migratory Bird Treaty Act.

Fifty-seven bird species were observed in flight or roosting in the study area during the 2019 surveys (Appendix B2). No nesting surveys were conducted as part of the reconnaissance level surveys. Bird observation records reviewed in the Cornell Lab of Ornithology's online bird observation database, called eBird, indicate that at least 116 bird species have been observed within the study area (eBird 2019).

Non-Special-Status Roosting Bats

Roosting non-special-status bats have the potential to forage and roost in trees, structures, and rock outcrops in the study area. CDFW typically recommends that substantial roost colonies of non-special-status bats (such as Mexican free-tailed bat) be protected from disturbance, especially during maternal roosting and hibernation.

3.4.2 Regulatory Framework

This section describes laws and regulations at the federal, state and local level that apply to the proposed project.

Federal Policies and Regulations

Endangered Species Act

Pursuant to the federal ESA, USFWS and the National Marine Fisheries Service (NMFS) have authority over projects that may result in take of a species listed as threatened or endangered under the act. Take is defined under the ESA, in part, as killing, harming, or harassing. Under federal regulations, take is further defined to include habitat modification or degradation that results, or is reasonably expected to result, in death or injury to wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. If a likelihood exists that a project would result in take of a federally listed species, either an incidental take permit, under Section 10(a) of the ESA, or a federal interagency consultation, under Section 7 of the ESA, is required. Endangered species are identified in the USFWS list in Appendix B1 and in Appendix B4, Tables B4-1 and B4-2.

One Habitat Conservation Plan was found to overlap with the study area, the PG&E San Joaquin Valley Operations and Maintenance Habitat Conservation Plan (PG&E HCP). The PG&E HCP allows PG&E to comply with the federal and state endangered species acts for small-scale temporary effects in the San Joaquin Valley. The PG&E HCP enables PG&E to conduct current and future operations and maintenance activities while minimizing, avoiding, and compensating for effects on listed species. Activities covered by the plan include gas pipeline protection, recoating, repair and replacement; electric line protection, repair, reconductoring, and replacement; electric pole repair/replacement; vegetation management to maintain clearances around facilities; minor new gas and electric extensions, and mitigation areas for impacts result from covered activities. The study area falls within the PG&E HCP plan area and covers many of the same species that have a potential to occur in the study area, including but not limited to vernal pool fairy shrimp, valley elderberry longhorn beetle, California tiger salamander, California red-legged frog, Swainson's hawk, and San Joaquin kit fox. The proposed project's relocation of electric transmission lines would not be covered under the PG&E HCP.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act, as amended in 1964, was enacted to protect fish and wildlife when federal actions result in the control or modification of a natural stream or body of water. The statute requires federal agencies to take into consideration the effect that water-related projects would have on fish and wildlife resources. Consultation and coordination with USFWS and the CDFW are required to address ways to prevent loss of and damage to fish and wildlife resources, and to further develop and improve these resources. The Project Partners will coordinate with CDFW through various means in the CEQA process, including scoping and CDFW review of this EIR, as well as through the regulatory permitting process. Reclamation will coordinate with USFWS through their Section 7 ESA consultation with USFWS and the review of Reclamation's NEPA document by USFWS.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) domestically implements a series of international treaties that provide for migratory bird protection. The MBTA authorizes the Secretary of the Interior to regulate the taking of migratory birds. The act further provides that it is unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird…" (16 USC 703). This prohibition includes both direct and indirect acts, although harassment and habitat modification are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by the MBTA can be found in the March 1, 2010 Federal Register (75 FR 9281). This list comprises several hundred species, including essentially all native birds. Permits for take of nongame migratory birds can be issued only for specific activities, such as scientific collecting, rehabilitation, propagation, education, taxidermy, and protection of human health and safety and of personal property. USFWS publishes a list of birds of conservation concern (BCC) to identify migratory nongame birds that are likely to become candidates for listing under ESA without additional conservation actions. The BCC list is intended to stimulate coordinated and collaborative conservation efforts among federal, state, tribal, and private parties. As discussed above non-special-status migratory birds have the potential to nest in the study area and Project Partners will comply with the MBTA.

The Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) (16 USC 668) prohibits take and disturbance of individuals and nests. Take permits for birds or body parts are limited to religious, scientific, or falconry pursuits. However, the BGEPA was amended in 1978 to allow mining developers to apply to USFWS for permits to remove inactive golden eagle (Aquila chrysaetos) nests in the course of "resource development or recovery" operations. With the 2007 removal of bald eagle from the ESA list of threatened and endangered species, USFWS issued new regulations to authorize the limited take of bald eagles (*Haliaeetus leucocephalus*) and golden eagles under the BGEPA, where the take to be authorized is associated with otherwise lawful activities. A final Eagle Permit Rule was published on September 11, 2009 (74 FR 46836–46879; 50 CFR 22.26).

A permit authorizes limited, non-purposeful take of bald eagles and golden eagles, and can be applied for by individuals, companies, government agencies (including tribal governments), and other organizations to allow disturbance or otherwise take eagles in the course of conducting lawful activities, such as operating utilities and airports. Under BGEPA, take is defined as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest or disturb." Disturb is defined in the regulations as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle; (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." Most permits issued under the new regulations authorize disturbance. In limited cases, a permit may authorize the physical take of eagles, but only if every precaution is first taken to avoid physical take. As discussed above, a golden eagle was observed in flight over the study area and the study area provides suitable foraging habitat for the species and suitable nesting habitat occurs to the west of the study area. The Project Partners will comply with the BGEPA.

Clean Water Act

Wetlands and other waters of the United States are protected under Section 404 of the Clean Water Act (CWA). Any activity that involves any discharge of dredged or fill material into waters of the United States, including wetlands, is subject to relation by the USACE. Waters of the United States are defined to encompass navigable waters of the United States; interstate waters; all other waters where their use, degradation, or destruction could affect interstate or foreign commerce; tributaries of any of these waters; and wetlands that meet any of these criteria or are adjacent to any of these waters or their tributaries. Wetlands are defined under Section 404 as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Jurisdictional wetlands must meet three wetland delineation criteria.

- They support hydrophytic vegetation (i.e., plants that grow in saturated soil).
- They have hydric soil types (i.e., soils that are wet or moist enough to develop anaerobic conditions).
- They have wetland hydrology.

Construction and operation of the proposed project have the potential to result in a discharge of pollutants or fill material into waters of the United States (e.g., Del Puerto Creek); therefore, a Section 404 CWA permit or Water Quality Certification would be required for the proposed project.

State Policies and Regulations

California Environmental Quality Act

CEQA is the regulatory framework by which California public agencies identify and mitigate significant environmental impacts. A project normally has a significant environmental impact on biological resources if it substantially affects a rare or endangered species or the habitat of that species, substantially interferes with the movement of resident or migratory fish or wildlife, or substantially diminishes habitat for fish, wildlife, or plants. The State CEQA Guidelines define rare, threatened, and endangered species as those listed under ESA or the CESA or any other species that meet the criteria of the resource agencies or local agencies (e.g., species of special concern, as designated by CDFW). The guidelines require that the lead agency preparing an EIR must consult with and receive written findings from CDFW concerning project impacts on species listed as endangered or threatened. The effects of a proposed project on these resources are important in determining whether the project has significant environmental impacts under CEQA. The Project Partners through the preparation of this EIR are evaluating the potentially significant environmental impacts on rare or endangered species or the habitat of that species, substantial interference with the movement of resident or migratory fish or wildlife, and substantial diminishment of habitat for fish, wildlife, or plants. Appendix B4, Table B4-2 identifies endangered or sensitive wildlife and fish.

CDFW maintains lists of plants of special concern in California, in addition to those listed as threatened or endangered. These species have no formal protection under CESA, but the values and importance of these lists are widely recognized. Plants with a California Rare Plant Rank of 1A, 1B, and 2 meet the definitions of Section 1901 of the California Fish and Game Code and may qualify for state listing. Accordingly, for purposes of this analysis, such plant species are considered rare plants pursuant to Section 15380 of CEQA. Appendix B4, Table B4-1 identifies those plants as having a California Rare Plant Rank.

California Endangered Species Act

CESA (California Fish and Game Code Sections 2050–2116) states that all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants and their habitats that are threatened with extinction and those experiencing a significant decline that, if not halted, would lead to a threatened or endangered designation will be protected or preserved.

Under Section 2081 of the California Fish and Game Code, a permit from CDFW is required for projects that could result in the take of a species that is state-listed as threatened or endangered. Under CESA, take is defined as an activity that would directly or indirectly kill an individual of a species. Unlike the definition under ESA, the definition of take under CESA does not include harm or harass. Consequently, the threshold for take under CESA is higher than that under ESA. For example, habitat modification is not necessarily considered take under CESA.

Fully Protected Species

Sections 3511, 3513, 4700, and 5050 of the California Fish and Game Code pertain to fully protected wildlife species (birds in Sections 3511 and 3513, mammals in Section 4700, and reptiles and amphibians in Section 5050) and strictly prohibit the take of these species. CDFW cannot issue a take permit for fully protected species, except under narrow conditions for scientific research or the protection of livestock, or if a Natural Community Conservation Plan (NCCP) has been adopted. Appendix B4, Table B4-2 identifies fully protected species of wildlife and fish.

California Native Plant Protection Act

The CNPPA of 1977 gave the California Fish and Game Commission the authority to list plant species as rare or endangered and authorized them to adopt regulations prohibiting importation of rare and endangered plants into California, take of rare and endangered plants, and sale of rare and endangered plants. The CNPPA prohibits take, possession, transportation, exportation, importation, or sale of rare and threatened plants, except as a result of agricultural practices, fire control measures, timber operations, mining, or actions of public agencies or private utilities. Private landowners are also exempt from the prohibition against removing rare and endangered plants, although they must provide 10-day notice to CDFW before removing the plants. The CNPPPA has mostly been superseded by CESA. Appendix B4, Table B4-1 identifies rare or endangered plants.

Protection of Birds and Raptors

Section 3503 of the California Fish and Game Code prohibits the killing of birds and/or the destruction of bird nests. Section 3503.5 prohibits the killing of raptor species and/or the destruction of raptor nests. Typical violations include destruction of active bird and raptor nests as a result of tree removal, and failure of nesting attempts (loss of eggs and/or young) as a result of disturbance of nesting pairs caused by nearby human activity. Section 3513 prohibits any take or possession of birds designated by the MBTA as migratory nongame birds except as allowed by federal rules and regulations pursuant to the MBTA.

Section 1600 of the California Fish and Game Code

Sections 1600–1603 of the California Fish and Game Code state that it is unlawful for any person or agency to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources, or to use any material from the streambeds, without first notifying CDFW. A Lake and Streambed Alteration Agreement (LSAA) must be obtained if effects are expected to occur. The regulatory definition of a stream is a body of water that flows at least periodically or intermittently through a bed or channel having banks and that supports wildlife, fish, or other aquatic life. This definition includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation. CDFW’s jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife. It is anticipated Del Puerto Creek will meet CDFW criteria in Section 1600 and as such the Project Partners would be required to obtain a 1600 permit from CDFW for construction and operation of the proposed project after approval of the proposed project and certification of the EIR.

Porter-Cologne Water Quality Control Act

Under the Porter-Cologne Act, waters of the state fall under jurisdiction of the nine Regional Water Quality Control Boards (Regional Boards). Under this act, each Regional Board must prepare and periodically update water quality control basin plans. Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control nonpoint and point sources of pollution. Projects that affect wetlands or waters must meet the waste discharge requirements of the Regional Board. Pursuant to CWA Sections 401, an applicant for a Section 404 permit to conduct any activity that may result in discharge into navigable waters must provide a certification from the Regional Board that such discharge would comply with state water quality standards. As part of the wetlands permitting process under Section 404, a project applicant would be required to obtain a water quality certification from the applicable Regional Board.

Section 13050 of the Porter-Cologne Act (California Water Code, Division 7) authorizes the State Water Resources Control Board and the relevant Regional Water Quality Control Board (in the case of the Del Puerto Canyon Reservoir, the Central Valley Regional Board) to regulate biological pollutants. The California Water Code generally regulates more substances contained in discharges and defines discharges to receiving waters more broadly than the CWA does. Waters of the state would be directly or indirectly affected during construction and operational activities associated with the proposed project and therefore the Project Partners would be required obtain a water quality certification after approval of the proposed project and certification of the EIR.

California Wetlands Conservation Policy

The goals of the California Wetlands Conservation Policy, adopted in 1993 (Executive Order W-59-93), are "to ensure no overall net loss, and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California, in a manner that fosters creativity, stewardship, and respect for private property"; to reduce procedural complexity in the administration of state and federal wetlands conservation programs; and to make restoration, landowner incentive programs and cooperative planning efforts the primary focus of wetlands conservation. Project Partners will comply with this policy through implementation of the regulations above (e.g., Porter-Cologne Water Quality Control Act).

California Fish and Game Code 1797.5

California FGC Section 1797.5 describes the State's policy to promote voluntary protection of functioning wildlife connectivity areas and habitat strongholds in order to enhance the resilience of wildlife and their habitats to climate change, protect biodiversity, and allow migration and movement of species by providing connectivity between habitat lands wherever feasible and practicable. This includes, but is not limited to, the acquisition or protection of wildlife corridors and open space through conservation easements; installation of wildlife-friendly or directional fencing; siting mitigation and conservation banks in areas that provide habitat connectivity; and provision of wildlife crossings such as overpasses, underpasses, modified culverts or bridges to allow for wildlife movement between habitat areas.

California Fish and Game Code Sections 1930, 1932, 1920.5, and 1932.5

California FGC Sections 1930 and 1932 1930.5, and 1932.5, require the CDFW to investigate, study, and identify areas in the state that are most essential as wildlife corridors and habitat linkages and to prioritize vegetative data development in those areas. AB 2785 also requires the CDFW to develop and maintain a database identifying those areas essential for maintaining habitat connectivity. It requires the CDFW to actively pursue grants and cost-sharing opportunities with local, state, and federal agencies as well as with private entities that use the data sets and benefit from their creation and maintenance.

Local Policies and Regulations

Stanislaus County

Stanislaus County has identified the following goals and policies in the Conservation Element of the General Plan (2016) that are relevant to the terrestrial biological resources located within the study area and that could be affected by the proposed project:

Goal One: Encourage the protection and preservation of natural and scenic areas throughout the County.

- Policy Two: Assure compatibility between natural areas and development.

  2.1 Review zoning regulations and landscaping requirements for compatibility between proposed development and natural areas, including protection from invasive plants.

  2.2 Review all development requests to ensure that sensitive areas (e.g., riparian habitats, vernal pools, rare plants) are left undisturbed or that mitigation measures acceptable to appropriate state and federal agencies are included in the project.

- Policy Three: Areas of sensitive wildlife habitat and plant life (e.g., vernal pools, riparian habitats, flyways and other waterfowl habitats, etc.) including those habitats and plant species listed by state or federal agencies shall be protected from development and/or disturbance.

  3.1 Review all development requests to ensure that sensitive areas (e.g., riparian habitats, vernal pools, rare plants, flyways, etc.) are left undisturbed or that mitigation measures acceptable to appropriate state and federal agencies are included in the project.

  3.2 In known sensitive areas, the State Department of Fish and Wildlife shall be notified as required by the California Native Plant Protection Act; the U.S. Fish and Wildlife Service also shall be notified.

  3.3 All discretionary projects that will potentially impact riparian habitat and/or vernal pools or other sensitive areas shall include mitigation measures for protecting that habitat.

  3.4 Implementation of this policy shall not be extended to the level of an unconstitutional "taking" of property.

  3.5 Any ground disturbing activities on lands previously undisturbed that will potentially impact riparian habitat and/or vernal pools or other sensitive areas shall include mitigation measures for protecting that habitat, as required by the State Department of Fish and Wildlife.

- Policy Four: Protect and enhance oak woodlands and other native hardwood habitat.

  4.1 Require all discretionary projects that will potentially impact oak woodlands and other native hardwood habitat, including but not limited to hardwood rangelands identified by the California Department of Forestry and Fire Protection, to include a management plan for the protection and enhancement of oak woodlands and other native hardwood habitat.

  4.2 Consider adoption of a tree protection ordinance to promote conservation of native trees or trees with historic significance.

Goal Two: Conserve water resources and protect water quality in the County.

- Policy Six: Preserve natural vegetation to protect waterways from bank erosion and siltation.

6.1 Development proposals and mining activities including, or in the vicinity of, waterways and/or wetlands shall be closely reviewed to ensure that destruction of riparian habitat and vegetation is minimized. This shall include referral to the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, State Department of Fish and Wildlife, and the State Department of Conservation.

Goal Ten: Protect fish and wildlife species of the County.

- Policy Twenty-nine: Habitats of rare and endangered fish and wildlife species, including special status wildlife and plants, shall be protected.

  29.1 The County shall utilize the California Environmental Quality Act (CEQA) process to ensure that development does not occur that would be detrimental to fish, plant life, or wildlife species.

  29.2 The County shall utilize the California State Department of Fish and Wildlife's California Natural Diversity Data Base and the California's Native Plant Society plant lists as the primary sources of information on special status wildlife and plants.

  29.3 The County shall protect sensitive wildlife habitat and plant life through the strategies identified under Policy Three of this element.

3.4.3 Impact Analysis

Methodology for Analysis

The methods for analysis of impacts on terrestrial resources are based on professional standards and information cited throughout this section. The key impacts were identified and evaluated based on the environmental characteristics of the study area and the expected magnitude, intensity, and duration of activities related to the construction and operation of the proposed project.

Direct impacts are those effects that are directly caused by project construction and operation (even if it takes time for the resulting effect to develop). Indirect impacts are those that occur either later in time or at a distance from the project location but are reasonably foreseeable, such as conversion of uplands to wetlands due to seepage into the adjacent habitat. Direct and indirect impacts can be either permanent or temporary. Impacts on habitat are generally considered temporary when the habitat is restored to preconstruction conditions within one year.

Permanent direct impacts on terrestrial resources were quantified using the estimated amount of land cover that would be converted as a result of construction of new facilities and the operation of the project, which would be from the filling of the reservoir. Temporary impacts on biological resources were quantified using the estimated amount of land cover that would be temporarily disturbed during project construction but would be restored to pre-project conditions within one year of disturbance. Temporarily impacted areas that would ultimately be inundated by the reservoir were totaled under the operational impacts to avoid double counting and because these would ultimately be considered permanent impacts. It is assumed that the conditions on parcels of land surrounding the reservoir would be maintained similar to existing conditions; e.g., grazing.

Impacts to biological resources identified within the study area were determined using geographic information system (GIS) software. The project footprint and associated temporary impact areas were overlaid on the vegetation community, wildlife habitat, and wetland data to quantify the permanent and temporary impacts associated with the construction and operation of the proposed project. Impacts on occurrences of special-status plants known to occur in the study area were determined by overlaying the project footprint over the mapped occurrences and determining the area of overlap. For impacts of the potential utility realignment corridor, it was assumed that 20 new towers would be constructed, each with a disturbance area of 0.023 acres, and that a new road for tower construction and conductoring and for future inspection and maintenance activities would be constructed, 10,000 feet long and 12 feet wide. It is assumed that transmission line towers would not be placed within wetlands and/or Del Puerto Creek. For pipeline relocation, the construction area was assumed to be 9,000 feet long and 15 feet wide (3 feet for the trench, 12 feet for access and sidecast material). It is assumed the pipeline alignment will avoid work in wetlands and will bore beneath Del Puerto Creek.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines,* as updated in December 2018, an impact on terrestrial resources would be considered significant if the project 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 California Department of Fish and Game or U.S. Fish and Wildlife Service.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.
- Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- 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.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Table 3.4-2 provides a summary of the location within this document of the various species impact analysis.

Table 3.4-2: Summary of Impact Discussion Locations

Impact Number and Thresholds of Significance	Sub-Impact Number	Species or Habitat Evaluated
Impact BIO-TERR-1 Substantial Adverse Effect on Listed, Candidate, Sensitive, or Special-Status Species		
	Impact BIO-TERR-1a	Special-Status Plants
	Impact BIO-TERR-1b	Vernal Pool Branchiopods
	Impact BIO-TERR-1c	Valley Elderberry Longhorn Beetle
	Impact BIO-TERR-1d	California Tiger Salamander
	Impact BIO-TERR-1e	California Red-legged Frog
	Impact BIO-TERR-1f	Western Spadefoot Toad
	Impact BIO-TERR-1g	Foothill Yellow-legged Frog
	Impact BIO-TERR-1h	Special-Status Reptiles
	Impact BIO-TERR-1i	Western Pond Turtle
	Impact BIO-TERR-1j	Western Burrowing Owl
	Impact BIO-TERR-1k	Special-Status Birds and Nesting Migratory Birds
	Impact BIO-TERR-1l	Swainson's Hawk
	Impact BIO-TERR-1m	Special-Status and Non-Special-Status Bats
	Impact BIO-TERR-1n	San Joaquin Kit Fox
	Impact BIO-TERR-1o	American Badger
Impact BIO-TERR-2 Substantial Adverse Effect on Riparian Habitat or Other Sensitive Natural Community	None	Riparian vegetation or sensitive natural communities
Impact BIO-TERR-3 Substantial Adverse Effect on State or Federally Protected Wetlands	None	Wetlands
Impact BIO-TERR-4 Interference with the Movement of Native Resident or Migratory Fish or Wildlife Species or Established Native Resident or Migratory Wildlife Corridors or Use of Native Wildlife Nursery Sites	None	Species identified in BIO-TERR-1, 2 and 4.
Impact BIO-TERR-5 Conflict with Local Policies or Ordinances Protecting Biological Resources	None	Blue Oak Woodlands and Oak Woodlands and species identified in Impacts BIO-TERR-1, -2, and -3
Impact BIO-TERR-6: Conflict with Adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other Approved Local, Regional, or State Habitat Conservation Plan	None	None
Impact BIO-TERR-7 Spread invasive plant species such that there would be a substantial effect on special-status species, sensitive communities, or wetlands	None	Blue Oak Woodlands and Oak Woodlands and species identified in Impacts BIO-TERR-1, -2, and -3

Impact BIO-TERR-1 Substantial Adverse Effect on Listed, Candidate, Sensitive, or Special-Status Species

Impact BIO-TERR-1a Special-Status Plants and Their Habitats

The proposed project could result in direct impacts, indirect impacts, and loss of habitat for special-status plants. The proposed project would result in direct permanent loss of upland habitat for special-status plants, including 39 acres of blue oak woodland, 79 acres of coastal scrub, and 854 acres of grasslands. In addition, the proposed project could result in temporary disturbance of 2 acres of coastal scrub and 529 acres of grassland. The proposed project could result in direct permanent loss of at least 25.0 acres of occupied habitat for big tarplant, 0.03 acre of occupied habitat for California alkali grass, 0.01 acre of habitat for San Benito poppy, and an undetermined amount of habitat for diamond-petaled California poppy and Lemmon's jewelflower. Most of these impacts would occur as the result of reservoir inundation, but some of the impacts to big tarplant would be due to realignment of Del Puerto Canyon Road. The proposed project could also result in indirect impacts on up to 7.0 acres of occupied habitat for big tarplant from utility realignment. As described in Section 3.4.1, Environmental Setting, Special-Status Plants, the Del Puerto Canyon occurrences of the big tarplant are significant because they represent the southernmost locality for the species and are the second-largest known population. Therefore, loss of these plants is likely to result in the loss of substantial genetic diversity for the species. Furthermore, the new occurrence of the California Alkali Grass is locally significant, as it represents the only known extant occurrence in Stanislaus County. ~~The proposed project could also potentially result in direct permanent loss of occupied habitat for 17 other special-status species, including one federally listed species, large-flowered fiddleneck (see Table B4-1 for the list of special-status species). The full extent of impacts on special-status plants is currently unknown, because botanical surveys for spring-blooming special-status plants have not been conducted in the study area.~~

Construction and Operation Impacts

The proposed project could result in temporary construction-related impacts on special-status plants where occupied habitat may be adjacent to construction areas in the utility relocation area and the saddle dam and access areas. The project could result in direct permanent loss of special-status plants where ground-disturbing activities would take place during construction. The proposed project could result in direct permanent loss of occupied habitat for special-status plants where the habitat would be inundated by reservoir operation.

Significance before Mitigation

Construction and operation of the proposed project would result in the permanent loss of big tarplant, and California alkali grass, and the potential permanent loss of diamond-petaled California poppy and Lemmon's jewelflower~~, and 17 other special-status species plants~~. This would have a substantial adverse effect on these special-status plants and impacts would be significant. Loss of San Benito poppy in the study area would be an adverse impact but would not be significant because it is locally and regionally common, despite its restricted distribution.

Mitigation Measures

Mitigation Measure BIO-TERR-1a Avoid and Minimize Impacts on Biological Resources

The Project Partners shall incorporate the following measures into construction plans.

- Employees and contractors performing construction and decommissioning activities will receive environmental sensitivity training. Training will include review of environmental laws, mitigation measures, permit conditions, and other requirements that must be followed by all personnel to reduce or avoid effects on biological resources during construction activities.
- Vehicles and equipment will be parked on pavement, existing roads, and previously disturbed areas to the extent practicable.

- Offroad vehicle travel will be avoided outside of the construction footprint.
- Grading will be restricted to the minimum area necessary.
- Prior to ground-disturbing activities, sensitive habitats will be flagged by a USFWS and CDFW approved biologist and temporary fencing will be in place during construction to reduce the potential for vehicles and equipment to stray into these areas.
- Vehicles or equipment will not be refueled within 100 feet of a wetland, stream, or other waterway unless a bermed and lined refueling area (i.e., a created berm made of sandbags or other removable material) is constructed.
- Erosion control measures will be implemented to reduce sedimentation in nearby aquatic habitat when activities are the source of potential erosion. Plastic monofilament netting (erosion control matting) or similar material containing netting will not be used at the project site. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.
- The following will not be allowed at or near work sites for project activities: trash dumping, firearms, open fires (such as barbecues), hunting, and pets.
- First- and second-generation ~~R~~rodenticides will not be used within the project site except for the limited use of zinc phosphide, or a rodenticide allowed for use by the California Department of Pesticide Regulation ~~within buildings, because of the key role that rodents play in providing a prey base and maintaining refuge habitat for special-status species~~.
- An approved biologist will be on site during initial ground-disturbing activities within and adjacent to grassland areas and during the removal of any trees. The biologist will assist the crew, as needed, to comply with all project implementation restrictions and guidelines. In addition, the biologist will be responsible for ensuring that contractors maintain exclusion areas adjacent to sensitive biological resources, and for documenting compliance with all biological resources–related mitigation measures.

Mitigation Measure BIO-TERR-1b: Avoid and Compensate for Adverse Effects on Special-Status Plant Species ~~Where Temporary Ground-disturbing Activities Would Take Place~~

Because the 2020 spring botanical surveys were inconclusive for several special-status plants that grow in grasslands, surveys of the grasslands must be conducted for special-status plants, ~~P~~prior to the start of any proposed project activities, ~~surveys of the study area shall be conducted for special-status plants~~ by qualified botanists in accordance with the appropriate protocols. The surveys shall be conducted in accordance with Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (California Department of Fish and Wildlife 2018c) during the season that special-status plant species would be evident and identifiable, which generally is during their blooming season. The surveys shall be conducted within no more than 3 years prior to the start of ground-disturbing activities. The results of the survey shall be submitted to DPWD and CDFW for review no less than 1 year prior to the start of ground-disturbing activities. The report will include the location and description of all proposed work areas and the location and description of all occupied habitat for special-status plant species, and it will identify locations where effective avoidance measures could be implemented. In areas where no special-status plant species are present no further mitigation would be required.

Where surveys determine that a special-status plant species is present in or adjacent to a project area where temporary ground-disturbing activities would take place, project impacts on the species shall be avoided through the establishment of activity exclusion zones, within which no ground-disturbing activities will take place, including construction staging, or other temporary work areas. Activity exclusion zones for special-status plant species shall be established around each occupied habitat site, the boundaries of which shall be clearly marked with standard orange plastic construction exclusion fencing or its equivalent. The establishment of activity exclusion zones shall not be required if no construction-related disturbances will occur within 250 feet of the occupied habitat. The size of activity exclusion zones may be reduced through consultation with a qualified biologist and with concurrence from CDFW based on site-specific conditions.

Prior to any activities that would result in permanent impacts on special-status plants, compensation habitat for each affected species shall be acquired and permanently protected at a ratio of 2 acres protected for every 1 acre that would be lost. Compensation habitat shall consist of existing, off-site occupied habitat acquired in-fee, through conservation easements, or from a certified conservation bank. The compensation habitat shall be monitored annually to verify that the habitat suitability is maintained. An operations and management plan shall be prepared and implemented for each compensation habitat, with funding provided through an endowment, to monitor the habitat and determine and implement appropriate management measures to maintain the habitat. Annual monitoring reports shall be submitted to CDFW for review and determination that the project remains in compliance with the mitigation.

Significance after Mitigation

Acquisition and permanent protection of occupied habitat for each affected species at a 2 to 1 (impact to compensation) ratio would reduce the impact to less than significant by ensuring some of the populations of these species would survive in perpetuity.

Impact BIO-TERR-1b Impacts on Vernal Pool Branchiopods

Construction Impacts

The relocation of Del Puerto Canyon Road would result in the permanent removal of 0.3 acre of potential vernal pool branchiopod habitat. Construction activities (such as grading and paving) could result in the injury and/or mortality of vernal pool branchiopod cysts and adults.

Depending on final designs, the realignment of the electrical and gas utilities could potentially result in permanent or temporary impacts on 0.9 acre of vernal pool branchiopod habitat (seasonal wetland) just off of the east side of Del Puerto Canyon Road (**Figure 3.4-1**). It is assumed that no permanent structures would be placed within seasonal wetlands. If utilities are relocated within 250 feet of this wetland, or such that they can be demonstrated to affect the wetland's hydrology, the hydrology in the pool could be permanently altered through changes in surface topography and subsurface hydrology. Construction activities could also result in the exposure of vernal pool branchiopods to construction fluids and materials if they were accidentally spilled in or near the wetland, which could result in injury and/or mortality of vernal pool branchiopods.

Operation Impacts

The filling of the reservoir would result in a permanent loss of 0.2 acres of potential vernal pool branchiopod habitat and in the injury and/or mortality of vernal pool branchiopod cysts and adults.

The day to day operations and maintenance activities would not likely result in effects on vernal pool branchiopods because this maintenance would occur within areas that are already disturbed and developed under the proposed project (e.g., roads, pump facilities, spillway, conveyance) or within the inundation area itself.

Significance before Mitigation

Though vernal pool fairy shrimp and vernal pool tadpole shrimp have not been specifically surveyed for in the study area and there are no previously documented occurrences in the study area, the habitat identified during the reconnaissance level surveys was determined to be sufficient to support these species. The construction and operation of the proposed project would result in the permanent loss of up to 1.4 acres of potential vernal pool branchiopod habitat and result in the potential injury and/or mortality of vernal pool branchiopods. This loss would have a substantial adverse effect on federally listed vernal pool branchiopods and impacts would be significant.

Mitigation Measures

Mitigation Measure BIO-TERR-1c: Compensate for the loss of habitat occupied by vernal pool fairy shrimp and/or vernal pool tadpole shrimp

At least one year prior to impacting any of the potential vernal pool branchiopod habitat, a biologist with a 10(a)(1)(A) recovery permit for vernal pool branchiopods shall conduct protocol level surveys for federally listed vernal pool branchiopods following the USFWS's 2015 Survey Guidelines for the Listed Large Branchiopods. These surveys require the completion of one dry season survey and one wet season survey. If no federally listed branchiopods are present no further mitigation would be required other than requirements under federal and state laws protecting wetlands. If federally listed branchiopods are determined to be present and are located in permanent disturbance areas then the Project Partners shall compensate for the loss of federally listed vernal pool branchiopod habitat through the purchase of credits from a USFWS approved mitigation bank at a conservation acreage of 2:1 protection and 1:1 restoration.

Significance after Mitigation

Implementation of Mitigation Measure BIO-TERR-1c, which commits to compensation for the loss of habitat occupied by vernal pool fairy shrimp and/or vernal pool tadpole shrimp, would reduce the impact on vernal pool branchiopods to less than significant because it would replace any occupied habitat lost.

Impact BIO-TERR-1c Impacts on Valley Elderberry Longhorn Beetle

Construction Impacts

The relocation of Del Puerto Canyon Road could result in the potential injury and/or mortality of valley elderberry longhorn beetle. As depicted in **Figure 3.4-2**, the proposed roadway realignment falls within 165 feet of one elderberry shrub. The elderberry shrub occurs at 490 feet in elevation, was observed to have potential exit holes, and occurs in association with an area mapped as riparian woodland. According to the U.S. Fish and Wildlife Service's 2017 *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (Framework), this shrub would be considered occupied. The development of the road would result in 0.2 acre of impact on riparian woodland approximately 300 feet upstream of the location of this shrub. Construction activities near potential habitat during the flight season of valley elderberry longhorn beetle (March-July) could disrupt dispersal, foraging and breeding behaviors and potentially result in injury or mortality of valley elderberry longhorn beetle.

Operation Impacts

The filling of the reservoir would inundate 17 elderberry shrubs, 14 along the existing Del Puerto Canyon Road and 3 up a canyon north of Del Puerto Creek. No exit holes were observed on these shrubs; however, several shrubs were inaccessible due to dense poison oak and steep terrain. All of these shrubs are below 500 feet in elevation and occur in non-riparian habitat but range between 50 to 300 feet from riparian habitat along Del Puerto Creek. If these shrubs are occupied by valley elderberry longhorn beetle, the inundation of the shrubs would result in a loss of habitat and the injury and/or mortality of beetle larvae, pupae, and/or adults.

The inundation will also result in the isolation of the elderberry shrub located near the realigned Del Puerto Canyon Road. The inundation would remove 16.3 acres of riparian woodland, a potential dispersal corridor, as well as remove the aforementioned shrubs.

The day to day operations and maintenance activities would not likely result in effects on valley elderberry longhorn beetle because this maintenance would occur within areas that are already disturbed and developed under the proposed project (e.g., roads, pump facilities, spillway, conveyance) or within the inundation area itself.

Significance before Mitigation

Elderberry shrubs (potential habitat) were identified along existing Del Puerto Canyon Road near where the realigned road will join the existing road and within the proposed inundation area in the western portion of the study area. Construction and operation of the proposed project would result in the permanent loss of 17 elderberry shrubs and could result in the injury and/or mortality of valley elderberry longhorn beetle. This loss would have a substantial adverse effect on valley elderberry longhorn beetle and impacts would be significant.

Mitigation Measures

Mitigation Measure BIO-TERR-1d Avoid, Minimize, and Compensate for Impacts of Valley Elderberry Longhorn beetle:

Preconstruction Exit Hole Surveys

Prior to filling the reservoir, elderberry shrubs in the inundation footprint shall be surveyed for exit holes following the guidance in the USFWS's Framework to determine if they have potentially become occupied by valley elderberry longhorn beetle.

Avoidance and Minimization Measures

The following measures come from the USFWS's 2017 Framework and are intended to be implemented where project construction occurs within 165 feet of elderberry shrubs, which currently is limited to one shrub near where the new road alignment ties back into the existing Del Puerto Canyon Road.

- **Fencing**. All areas to be avoided during construction activities will be fenced and/or flagged as close to construction limits as feasible.
- **Avoidance area**. Activities that may damage or kill an elderberry shrub (e.g., trenching, paving) may need an avoidance area of at least 6 meters (20 feet) from the drip-line, depending on the type of activity.
- **Worker education**. A qualified biologist will provide training for all contractors, work crews, and any onsite personnel on the status of the VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for noncompliance.
- **Construction monitoring**. A qualified biologist will monitor the work area at project-appropriate intervals to assure that all avoidance and minimization measures are implemented. The amount and duration of monitoring will depend on the project specifics and will be discussed with the Service biologist.
- **Timing**. As much as feasible, all activities that could occur within 50 meters (165 feet) of an elderberry shrub, will be conducted outside of the flight season of the VELB (March - July).
- **Trimming**. Trimming may remove or destroy VELB eggs and/or larvae and may reduce the health and vigor of the elderberry shrub. In order to avoid and minimize adverse effects to VELB when trimming, trimming will occur between November and February and will avoid the removal of any branches or stems that are ≥ 1 inch in diameter. Measures to address regular and/or large-scale maintenance (trimming) shall be established in consultation with USFWS.
- **Chemical Usage**. Herbicides will not be used within the drip-line of the shrub. Insecticides will not be used within 30 meters (98 feet) of an elderberry shrub. All chemicals will be applied using a backpack sprayer or similar direct application method. 12 Mowing. Mechanical weed removal within the drip-line of the shrub will be limited to the season when adults are not active (August - February) and will avoid damaging the elderberry.
- **Erosion Control and Re-vegetation**. Erosion control will be implemented and the affected area will be re-vegetated with appropriate native plants.

Compensation

If no occupied shrubs would be lost, no further mitigation would be required. If shrubs determined to be occupied by valley elderberry longhorn beetle are lost due to project construction and/or inundation, the Project Partners shall compensate for the loss of individual shrubs by purchasing credits at a USFWS approved mitigation bank. Per the USFWS 2017 Framework, those shrubs that can be transplanted (i.e., those not on cliffs and those that are likely to withstand transplantation) will also be moved to the USFWS approved mitigation bank. The specific location for the mitigation will be developed during Reclamation's consultation with the USFWS.

Significance after Mitigation

Implementation of Mitigation Measures BIO-TERR-1a and BIO-TERR-1d, which provide measures for avoiding, minimizing, and compensating for effects on valley elderberry longhorn beetle, and Mitigation Measure BIO-TERR-2, which requires for the compensation of riparian habitat lost due to the proposed project, would reduce the impact on valley elderberry longhorn beetle to less than significant because it would ensure that the potential for take is avoided and minimized during construction and operations, and that lost habitat is replaced. Currently no occupied elderberry shrubs, those either occurring in riparian habitat or those occurring in non-riparian with observed exit holes, are known to be directly within the construction and/or inundation footprint. If any shrubs are later determined to be occupied, they shall be transplanted to a USFWS approved conservation area and mitigated as discussed above, which would ensure that occupied shrubs are not affected by the project.

Impact BIO-TERR-1d Impacts on California Tiger Salamander

Construction Impacts

The relocation of Del Puerto Canyon Road, construction of the dams and associated reservoir facilities, and the realignment of the electrical and gas utilities would result in the permanent removal of 148 acres of potential California tiger salamander upland habitat and 0.2 acre of potential aquatic habitat (**Figure 3.4-3**). These activities would also result in temporary impacts on 223 acres of potential California tiger salamander upland habitat. The one pond identified as suitable aquatic habitat falls within the area identified as needed for the access to and construction of two of the saddle dams, which may involve the excavation and grading of soils used in construction.

Construction activities associated with dam construction, the road realignment, and utility relocation could result in the injury and/or mortality of California tiger salamander if they are moving on the surface or occupying small mammal burrows or soil crevices during construction activities, such as grading, excavation, and the use of construction related vehicles. Construction activities could also result in the exposure of California tiger salamander to construction related fluids, such as fuels, oils, and cement, which could result in the injury and/or mortality of larvae and adults.

Construction lighting during night work could disrupt normal behaviors of California tiger salamander if lighting spills over into adjacent habitats potentially resulting in delayed dispersal movements and subjecting them to an increased predation risk.

Operation Impacts

The filling of the reservoir would result in a permanent loss of 403 acres of potential upland habitat for California tiger salamander. The filling of the reservoir would also create a substantial barrier to the north-south movement of California tiger salamander, though north-south movement between the dam and I-5 as well as to the west of the reservoir would still be possible.

Maintenance activities, such as vegetation control, rodent control, erosion control, and associated vehicle traffic could result in the injury and/or mortality of California tiger salamander if they are occupying upland areas where these activities are taking place and are exposed to chemicals used for some of these activities.

Lighting for the dam control house, inlet/outlet works control building, and bifurcation structure could disrupt normal behaviors of California tiger salamander if lighting spills over into adjacent habitats potentially resulting in delayed dispersal movements and subjecting them to an increased predation risk.

Significance before Mitigation

Potential breeding habitat is present in a stock pond in the study area, and upland habitat is present in grassland throughout the study area. The construction and operation of the proposed project would result in the permanent loss of up to 551 acres of potential California tiger salamander upland habitat and 0.2 acres of potential aquatic habitat, and temporary impacts on up to 223 acres of potential upland habitat. The project could also result in the potential injury and/or mortality of California tiger salamander. This loss would have a substantial adverse effect on California tiger salamander and impacts would be significant.

Mitigation Measures

Mitigation Measure BIO-TERR-1e: Avoid and Minimize Impacts on Special-Status Amphibians

Conduct Protocol Level Surveys

To guide the implementation of avoidance and minimization measures, protocol level surveys for California tiger salamander, California red-legged frog, and foothill yellow-legged frog shall be conducted by a USFWS and CDFW-approved biologist (approved biologist) that possess necessary handling permits (California tiger salamander only).

- California tiger salamander surveys will be conducted in potentially suitable habitat according to the USFWS's and CDFW's *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* (U.S. Fish and Wildlife Service and California Department of Fish and Wildlife 2003).
- California red-legged frogs surveys will be conducted in potentially suitable habitat according to the USFWS's *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (U.S. Fish and Wildlife Service 2005).
- Foothill yellow-legged frog surveys will be conducted according to CDFW's *Considerations for Conserving the Foothill Yellow-Legged Frog* (California Department of Fish and Wildlife 2018b) or the most up to date survey protocol at that time.

No specific protocol has been developed for western spadefoot toad but presence will be determined by conducting surveys during the winter and spring to identify adults, egg masses, larvae , and/or metamorphs.

Avoidance and Minimization Measures

The following measures shall be implemented to avoid and minimize effects on special-status amphibians during construction and maintenance activities, if presence is confirmed by protocol level surveys of special-status amphibians as described above.

- Ground disturbance will be limited to permanent and temporary impact areas identified in final plans for the reservoir.
- The pond that falls within the area identified as needed for access to and construction of two of the saddle dams will be avoided during construction by placing high visibility fencing around the perimeter of the pond. The fencing will be open at the bottom to allow the movement of wildlife in and out of the pond.
- The approved biologist will be present during all ground-disturbing activities and during any activities involving heavy equipment in used in or adjacent to suitable upland and/or aquatic habitat.
- Maintenance activities in vegetated areas will be conducted during the dry season (generally April 1 to October 14) and will avoid and minimize disturbance to small mammal burrows. Use

of first- and second-generation rodenticides shall not be permitted except for the limited use of zinc phosphide, or a rodenticide allowed for use by the California Department of Pesticide Regulation.

- Within habitat for California tiger salamander, California red-legged frog, and western spadefoot toad initial ground-disturbing activities will not take place during the rainy season, generally October 15 to March 31 (or until the first measurable rain of 1 inch or greater), to avoid the period when most amphibian movement across upland habitat are expected to occur.
- Ground disturbing activities may take place during the wet season in areas where potential habitat for special-status amphibians has been removed and when an approved biologist is present to monitor activities.
- When work occurs in special-status amphibian habitat, the approved biologist will conduct a pre-activity survey immediately prior to work beginning. The biologist will inspect beneath equipment, vehicles, and stored materials that had been left in the work area overnight.
- If a special-status amphibian is found in a work area it will at first be allowed to move out of the work area on its own but if there is no suitable habitat for the animal to freely move to it will be relocated by the approved biologist to a pre-determined location identified in coordination with USFWS and CDFW.
- To prevent the accidental entrapment of species during construction, all excavated trenches and holes deeper than 6 inches will be ramped at the end of the workday to allow trapped animals a means of escaping. Earthen ramps will be constructed at each end of the active trench and boards will be placed in open holes. Each day that a trench and/or hold is open and prior to backfilling, these areas will be inspected by a USFWS and CDFW approved monitor. If an animal is found trapped in a trench or hole, construction will cease until it exits the trench or hole on its own or is relocated to an approved location by a USFWS and CDFW-approved biologist.
- If work in suitable special-status amphibian habitat occurs during the rainy season, generally October 15 to March 31, and lasts for more than 1 day, exclusion fencing will be installed between the work area and areas of suitable habitat. A USFWS and CDFW approved biologist will determine where exclusion fencing will be installed. The fencing will be installed to a depth of 6 inches and be at least 36 inches above grade. The contractor will avoid placing fencing on top of ground squirrel burrows. A qualified biologist will inspect the fencing daily for the presence of these species.
- If the exclusion fence is found to be compromised at any time, a survey will be conducted immediately preceding construction activity that occurs in special-status amphibian habitat or in advance of any activity that may result in take of the species. The biologist will search along exclusion fences and in pipes and beneath vehicles before they are moved. The survey will include a careful inspection of all potential hiding spots, such as along exclusion fencing, large downed woody debris, the perimeter of ponds, wetlands, and riparian areas. Any special-status amphibians found will either be allowed to move on its own accord or will be captured and relocated as described above.
- Between when construction begins and when the reservoir is filled, when construction activities occur in streams, temporary aquatic barriers such as hardware cloth will be installed both up and downstream of the in-stream work area, and special-status amphibians will be relocated and excluded from the work area. The approved biologist will establish an adequate buffer on both sides of creeks and around potential aquatic habitat and will restrict entry during the construction period.
- If the use of pumps is necessary for diverting flows or dewatering Del Puerto Creek during construction of the dam, pump intakes will be fitted with a screen-type device consisting of, at minimum, a water intake strainer. Water intake strainers are most appropriate for low-volume diversion projects. For high-volume water diversion projects or other diversion activities that may warrant greater protection, pump intakes shall be fitted with screens made of woven mesh,

perforated plate, or wedge wire. The screen medium must be able to withstand forces related to pumping and be of sufficient size to prevent amphibian larvae from entering the intake and being diverted within the water.

Mitigation Measure BIO-TERR-1f: Compensation for the loss of California Tiger Salamander Habitat

If protocol level surveys determine that California tiger salamander is not present in the study area then no further mitigation is required. If California tiger salamander is present in aquatic and upland habitat in the study area, the habitat permanently lost due to the proposed project shall be mitigated at a minimum of 1:1. Mitigation shall be achieved through either purchasing credits a USFWS and CDFW approved mitigation bank or through the purchase of a conservation easement with an associated endowment approved by USFWS and CDFW. Any conservation lands will be shown to be occupied by California tiger salamander and will be managed in perpetuity for the benefit of the species. Details of the mitigation shall be further developed in consultation with USFWS and CDFW.

Significance after Mitigation

Implementation of Mitigation Measures BIO-TERR-1a, BIO-TERR-1e, and BIO-TERR-1f, which provide measures for avoiding, minimizing, and compensating for impacts on California tiger salamander, and Mitigation Measures ~~AES-4~~ AES-2 and ~~AES-5~~ AES-3, which minimize potential impacts from construction and operational lighting, would reduce the impact on California tiger salamander to less than significant because it would ensure that the potential for take is avoided and minimized during construction and operations, and would replace any aquatic habitat lost and preserve and manage suitable upland habitat.

Impact BIO-TERR-1e Impacts on California Red-legged Frog

Construction Impacts

The relocation of Del Puerto Canyon Road, construction of the dams and associated reservoir facilities, and the realignment of the electrical and gas utilities would result in the permanent removal of 34 acres of potential California red-legged frog upland habitat and 2 acres of potential aquatic habitat (**Figure 3.4-4**). These activities would also result in temporary impacts on 13 acres of potential upland habitat and 0.5 acres of potential aquatic habitat. The one pond identified as suitable aquatic habitat falls within the area identified as needed for access to and construction of two of the saddle dams, which may involve the excavation and grading of soils for use in dam construction.

Construction activities associated with dam construction, the road realignment, and utility relocation could result in the injury and/or mortality of California red-legged frog if they are occupying upland habitat or dispersing through the project area during construction activities, such as grading, excavation, and the use of construction related vehicles. Construction activities could also result in the exposure of California red-legged frog to construction related fluids, such as fuels, oils, and cement, which could result in the injury and/or mortality of larvae and adults.

Construction lighting during night work could disrupt normal behaviors of California red-legged frog if lighting spills over into adjacent habitats potentially resulting in delayed dispersal movements, disrupting foraging and breeding, and an increased predation risk.

Operation Impacts

The filling of the reservoir would result in a permanent loss of 251 acres of potential upland habitat and 29 acres of potential aquatic habitat for California red-legged frog. The filling of the reservoir would also create a substantial barrier to the north-south movement of California red-legged frog, though north-south movement between the dam and I-5 as well as to the west of the reservoir would still be possible.

The filled reservoir will also create conditions more suitable for American bullfrog and non-native fish, which could prey on and compete with California red-legged frog in areas upstream of the reservoir.

Maintenance activities, such as vegetation control, rodent control, erosion control, and associated vehicle traffic could result in the injury and/or mortality of California red-legged frog if they are occupying upland areas where these activities are taking place and are exposed to chemicals used for some of these activities.

Lighting for the dam control house, inlet/outlet works control building, and bifurcation structure could disrupt normal behaviors of California red-legged frog if lighting spills over into adjacent habitats potentially resulting in delayed dispersal movements, disrupted foraging and breeding, and an increased predation risk.

Significance before Mitigation

Potential aquatic and upland habitat for California red-legged frog was identified during the reconnaissance level surveys. The construction and operation of the proposed project would result in the permanent loss of up to 285 acres of California red-legged frog upland habitat, 817 acres of dispersal habitat, and 31 acres of aquatic habitat and result in the potential injury and/or mortality of California red-legged frog, and temporary impacts on up to 13 acres of upland habitat, 0.5 acre of aquatic habitat, and 673 acres of dispersal habitat. This loss would have a substantial adverse effect on California red-legged frog and impacts would be significant.

Mitigation Measures

Mitigation Measure BIO-TERR-1g: Compensate for the Loss of California Red-legged Frog Habitat

If protocol level surveys determine that California red-legged frog is not present no compensatory mitigation would be required. If California red-legged frog is present in aquatic and upland habitat in the study area, the habitat permanently impacted due to the proposed project shall be mitigated at a minimum of 1:1. Mitigation shall be achieved through either purchasing credits at a USFWS approved mitigation bank or through the purchase of a conservation easement with an associated endowment approved by USFWS. Any conservation lands will be shown to be occupied by California red-legged frog and will be managed in perpetuity for the benefit of the species. Details of the mitigation shall be further developed in consultation with USFWS.

Significance after Mitigation

Implementation of Mitigation Measures BIO-TERR-1a, BIO-TERR-1e, and BIO-TERR-1g, which provide measures for avoiding, minimizing, and compensating for effects on California red-legged frog, and Mitigation Measures ~~AES-4~~ AES-2 and ~~AES-5~~ AES-3, which minimize potential effects from construction and operational lighting would reduce the impact on California red-legged frog to less than significant because it would ensure that the potential for take is avoided and minimized during construction and operations, and would replace any aquatic habitat lost and preserve and manage suitable upland habitat.

Impact BIO-TERR-1f Impacts on Western Spadefoot Toad

Construction Impacts

The relocation of Del Puerto Canyon Road, construction of the dams and associated reservoir facilities, and the realignment of the electrical and gas utilities would result in the permanent removal of 107 acres of potential western spadefoot toad upland habitat and 1.9 acre of potential aquatic habitat. These activities would also result in temporary impacts on 527 acres of potential upland habitat and 0.5 acre of potential aquatic habitat. The one pond identified as suitable aquatic habitat falls within the area identified as needed for the access to and construction of two of the saddle dams, which may involve the excavation and grading of soils for use in dam construction.

Construction activities associated with dam construction, the road realignment, and utility relocation could result in the injury and/or mortality of western spadefoot toad if they are moving on the surface or occupying uplands during construction activities, such as grading, excavation, and the use of construction related vehicles. Construction activities could also result in the exposure of western spadefoot toad to construction related fluids, such as fuels, oils, and cement, which could result in the injury and/or mortality of larvae and adults.

Construction lighting during night work could disrupt normal behaviors of western spadefoot toad if lighting spills over into adjacent habitats potentially resulting in delayed dispersal movements, disrupted foraging and breeding, and an increased predation risk.

Operation Impacts

The filling of the reservoir would result in a permanent loss of 748 acres of potential upland habitat and 29 acres of potential aquatic habitat for western spadefoot toad. The filling of the reservoir would also create a substantial barrier to the north-south movement of western spadefoot toad, though north-south movement between the dam and I-5 as well as to the west of the reservoir would still be possible.

The filled reservoir will also create conditions more suitable for American bullfrog and non-native fish, which could prey on and compete with western spadefoot larvae in areas upstream of the reservoir.

Maintenance activities, such as vegetation control, rodent control, erosion control, and associated vehicle traffic could result in the injury and/or mortality of western spadefoot toad if they are occupying upland areas where these activities are taking place and are exposed to chemicals used for some of these activities.

Lighting for the dam control house, inlet/outlet works control building, and bifurcation structure could disrupt normal behaviors of western spadefoot toad if lighting spills over into adjacent habitats potentially resulting in delayed dispersal movements, disrupted foraging and breeding, and an increased predation risk.

Significance before Mitigation

Potential aquatic and upland habitat for western spadefoot toad was identified during the wildlife surveys, and the species has been previously documented just outside the study area (California Department of Fish and Wildlife 2019b). The construction and operation of the proposed project would result in the permanent loss of up to 855 acres of potential western spadefoot toad upland habitat and 31 acres of potential aquatic habitat, and temporary impacts on up to 527 acres of upland habitat and 0.5 acre of aquatic habitat. Construction activities could also result in the potential injury and/or mortality of western spadefoot toad. This loss would have a substantial adverse effect on western spadefoot toad and impacts would be significant.

Mitigation

Refer to Mitigation Measures BIO-TERR-1a, BIO-TERR-1e, BIO-TERR-1f, BIO-TERR-1g, and BIO-TERR 3.

Significance after Mitigation

Implementation of Mitigation Measures BIO-TERR-1a, BIO-TERR-1e, BIO-TERR-1f, and BIO-TERR-1g would provide measures for avoiding, minimizing, and compensating for effects on special-status amphibians. Also, Mitigation Measure BIO-TERR 3, compensation for impacts on wetlands and water, may also benefit western spadefoot toad. Mitigation Measures ~~AES-4~~ AES-2 and ~~AES-5~~ AES-3 would minimize potential effects from construction and operational lighting. Though compensatory mitigation would be specifically for California tiger salamander and California red-legged frog, there is overlap in the habitat requirements of these species and western spadefoot toad and therefore, together with the avoidance and minimization measures, this compensatory mitigation, together with mitigation for wetlands and waters, would reduce the impact on western spadefoot toad to less than significant because it would ensure that the potential for injury and mortality is avoided and minimized during construction and operations, and would replace any aquatic habitat lost and preserve and manage suitable upland habitat.

Impact BIO-TERR-1g Impacts on Foothill Yellow-legged Frog

Construction Impacts

The construction of the dams and associated reservoir facilities would result in the permanent removal of 2 acres of potential foothill yellow-legged frog aquatic habitat and 0.2 acres of adjacent riparian habitat. These activities would also result in temporary impacts on 0.3 acre of aquatic habitat.

Construction activities associated with dam construction, the road realignment, and utility relocation could result in the injury and/or mortality of foothill yellow-legged from if they are occupying Del Puerto Creek and adjacent riparian and wetlands during construction activities, such as grading, excavation, and the use of construction related vehicles. Construction activities could also result in the exposure of foothill yellow-legged frog to construction related fluids, such as fuels, oils, and cement, which could result in the injury and/or mortality of larvae and adults.

Construction lighting during night work could disrupt normal behaviors of foothill yellow-legged frog if lighting spills over into adjacent habitats potentially resulting in a disruption in normal behaviors, including breeding, foraging, dispersal, and in an increased predation risk.

Operation Impacts

The filling of the reservoir would result in a permanent loss of 29 acres of potential aquatic habitat and 16 acres of adjacent riparian habitat for foothill yellow-legged frog. The filled reservoir will also create conditions more suitable for American bullfrog and non-native fish, which could prey on and compete with foothill yellow-legged frog in areas upstream of the reservoir.

Maintenance activities, such as vegetation control, erosion control, and associated vehicle traffic could result in the injury and/or mortality of foothill yellow-legged frog if these activities take place where Del Puerto Creek enters the reservoir.

Lighting for the dam control house, inlet/outlet works control building, and bifurcation structure could disrupt normal behaviors of foothill yellow-legged frog if lighting spills over into adjacent habitats potentially resulting in a disruption in breeding, foraging, and dispersal, and in increased predation risk.

<u>Significance before Mitigation</u>

Potential habitat for foothill yellow-legged frog was identified during the wildlife survey, and the species has been previously documented just outside the west boundary of the study area. The construction and operation of the proposed project would result in the permanent loss of up to 31 acres and temporary impacts on 0.3 acre of potential foothill yellow-legged frog aquatic habitat and a permanent loss of 16 acres of riparian habitat and result in the potential injury and/or mortality of foothill-yellow legged frog. This loss would have a substantial adverse effect on foothill yellow-legged frog and impacts would be significant.

<u>Mitigation Measures</u>

Mitigation Measure BIO-TERR-1h: Compensate for the Loss of Foothill Yellow-legged Frog Habitat

If surveys determine that foothill yellow-legged frog is not present in Del Puerto Creek no further mitigation is necessary. If foothill yellow-legged from is present, the habitat permanently impacted due to the proposed project shall be fully mitigated by either purchasing property and/or a conservation easement that contains stream habitat of similar quality and quantity and that is currently occupied by foothill yellow-legged frog and/or represents an area that has been historically occupied and where successful recolonization is likely (e.g., known occupation in nearby watershed or tributary). A final mitigation plan shall be developed and approved by CDFW. The plan shall include measures for the long-term management of these lands for the benefit of foothill yellow-legged frog and include adaptive management measures.

Significance after Mitigation

Implementation of Mitigation Measures BIO-TERR-1a, BIO-TERR-1e, and BIO-TERR-1h, which provide measures for avoiding and minimizing effects on special-status amphibians and compensate for the loss of occupied foothill yellow-legged frog habitat, and Mitigation Measures ~~AES-4~~ AES-2 and ~~AES-5~~ AES-3, which minimize potential effects from construction and operational lighting, would reduce the impact on foothill yellow-legged frog to less than significant.

Impact BIO-Terr-1h Impact on Special-Status Reptiles

Construction Impacts

The relocation of Del Puerto Canyon Road, construction of the dams and associated reservoir facilities, and the realignment of the electrical and gas utilities would result in the permanent removal of 138 acres and temporary disturbance of 530 acres of grassland and scrub areas that provide potential habitat for special-status reptiles, which includes Blainville's horned lizard, northern California legless lizard, and San Joaquin coachwhip.

Construction activities associated with dam construction, the road realignment, and utility relocation could result in the injury and/or mortality of special-status reptiles if they are moving on the surface or occupying uplands during construction activities, such as grading, excavation, and the use of construction related vehicles. Construction activities could also result in the exposure of special-status reptiles to construction related fluids, such as fuels, oils, and cement, which could result in the injury and/or mortality of larvae and adults.

Construction lighting during night work could disrupt normal behaviors of special-status reptiles if lighting spills over into adjacent habitats potentially resulting in a disruption in of breeding, foraging, dispersal, and in increased predation.

Operation Impacts

The filling of the reservoir would result in a permanent loss of 822 acres of potential habitat for special-status reptiles. The filling of the reservoir would also create a substantial barrier to the north-south movement of reptiles, though north-south movement between the dam and I-5 as well as to the west of the reservoir would still be possible.

Maintenance activities, such as vegetation control, rodent control, erosion control, and associated vehicle traffic could result in the injury and/or mortality of special-status reptiles if they are occupying upland areas where these activities are taking place and are exposed to chemicals used for some of these activities.

Lighting for the dam control house, inlet/outlet works control building, and bifurcation structure could disrupt normal behaviors of special-status reptiles if lighting spills over into adjacent habitats potentially resulting in a disruption in breeding, foraging, and dispersal, and in increased predation risk.

Significance before Mitigation

Special-status reptiles with the potential to occur in the study area include Blainville's horned lizard, northern California legless lizard, and San Joaquin coachwhip. The construction and operation of the proposed project would result in the permanent loss of up to 960 acres and temporary impacts on up to 530 acres of potential habitat for special-status reptiles. The construction and operations activities could also result in the injury and mortality of special-status reptiles. This loss of habitat and/or injury and mortality would have a substantial adverse effect on special-status reptiles and impacts would be significant.

Mitigation Measures

Mitigation Measure BIO-TERR-1i: Avoid and Minimize Impacts on Special-Status Reptiles

The following measures shall be implemented to ensure that the proposed project does not have a significant impact on special-status reptiles.

- The approved biologist monitoring construction will survey for special-status reptiles in areas of suitable habitat (i.e., permanent removal of 138 acres and temporary disturbance of 530 acres of grassland and scrub ~~described above~~) immediately prior to initial ground disturbing activities and vegetation removal. If special-status reptiles are not found, no additional measures are required.
- If any special-status reptiles are found, work will not begin until they are allowed to passively move out of the work area or are relocated to a CDFW-approved relocation site. Relocation of these species would require consulting with CDFW and a letter from CDFW authorizing this activity.
  - No monofilament plastic will be used for erosion control.
  - The approved biologist will inspect open trenches and pits and under construction equipment and materials left on site for special-status reptiles each morning before equipment and materials are moved.
  - Ground disturbance in suitable habitat will be minimized to the extent practicable.
  - Vegetation outside the work area will not be removed.
  - All vegetation removal will be monitored by the approved biologist to minimize impacts on special-status reptiles.

Significance after Mitigation

Implementation of Mitigation Measures BIO-TERR-1a, BIO-TERR-1i, and BIO-TERR-1m which provide measures for avoiding and minimizing effects on special-status reptiles and compensate for the loss of grassland habitat (Swainson's hawk foraging, which is described below) and Mitigation Measures ~~AES-4~~ AES-2 and ~~AES-5~~ AES-3, which minimize potential effects from construction and operational lighting, would reduce the impact on special-status reptiles to less than significant because injury and/or mortality will be avoided and minimized and suitable habitat will be replaced.

Impact BIO-TERR-1i Impact on Western Pond Turtle

Construction Impacts

The relocation of Del Puerto Canyon Road, construction of the dams and associated reservoir facilities, and the realignment of the electrical and gas utilities would result in the permanent removal of 2 acres of potential western pond turtle aquatic habitat and 34 acre of potential upland habitat. These activities would also result in temporary impacts on 13 acres of potential upland habitat and 0.5 acre of potential aquatic habitat.

Construction activities associated with dam construction, the road realignment, and utility relocation could result in the injury and/or mortality of western pond turtle if they are moving on the surface or occupying Del Puerto Creek and uplands during construction activities, such as grading, excavation, and the use of construction related vehicles. Construction activities could also result in the exposure of western pond turtle to construction related fluids, such as fuels, oils, and cement, which could result in the injury and/or mortality of eggs, hatchlings, and adults.

Operation Impacts

The filling of the reservoir would remove potential habitat associated with pools in Del Puerto Creek but the reservoir would increase the amount of aquatic habitat available to western pond turtle in the study area. Depending on when the filling of the reservoir takes place, western pond turtle eggs laid in uplands could become inundated and suffer injury and/or mortality.

Maintenance activities, such as vegetation control, rodent control, erosion control, and associated vehicle traffic could result in the injury and/or mortality of western pond turtle if they are occupying upland areas where these activities are taking place and are exposed to chemicals used for some of these activities.

Significance before Mitigation

Suitable aquatic habitat and upland nesting habitat for western pond turtle are present in the study area. The construction and operation of the proposed project would result in an initial loss of 31 acres of aquatic and 285 acres of upland habitat; however, the new reservoir and nearby upland would more than replace the amount of potential habitat lost for western pond turtle. Construction and maintenance activities could result in the injury and/or mortality of western pond turtle. Though the proposed project may result in a net increase in habitat for western pond turtle, contraction and operations could still result in the injury and mortality of a special-status species, which would be significant.

Mitigation Measures

> No specific measures for western pond turtle are proposed at this time; however, Mitigation Measure TERR-1a would include measures that would avoid and minimize effects on habitats and wildlife in general, which would also avoid and minimize effects on western pond turtle.

Significance after Mitigation

Implementation of Mitigation Measure TERR-1a, which includes construction monitoring and worker education and measures to protect water quality, would avoid and minimize the potential for the injury and/or mortality of western pond turtle during construction and maintenance activities. These measures would reduce the impact on western pond turtle to less than significant because they would avoid and minimize injury and/or mortality of western pond turtle.

Impact BIO-TERR-1j Impact on Western Burrowing Owl

Construction Impacts

The relocation of Del Puerto Canyon Road, construction of the dams and associated reservoir facilities, and the realignment of the electrical and gas utilities would result in the permanent removal of 107 acres and temporary disturbance of 527 acre of potential western burrowing owl habitat.

Construction activities associated with dam construction, the road realignment, and utility relocation could result in the disruption of normal behaviors, injury, and/or mortality of western burrowing owl eggs, juveniles, and adults if they are occupying annual grasslands during construction activities, such as grading, excavation, and the use of construction related vehicles.

Operation Impacts

The filling of the reservoir would result in a permanent loss of 748 acres of potential western burrowing owl habitat and could result in the injury and/or mortality of eggs and nestlings and could decrease survivorship of adults if they are displaced from their home range.

Maintenance activities, such as vegetation control, rodent control, erosion control, and associated vehicle traffic could result in the disruption of normal behaviors through noise and visual disturbance and result in the injury and/or mortality of western burrowing owl if they are occupying upland areas where these activities are taking place and are exposed to chemicals used for some of these activities.

Significance before Mitigation

This species has been previously documented in the study area and suitable habitat was identified during the wildlife surveys. The construction and operation of the proposed project would result in the permanent loss of up to 854 acres and temporary effects on up to 529 acres of potential western burrowing owl habitat and in the potential disruption of normal behaviors, injury, and/or mortality of western burrowing owl. This loss would have a substantial adverse effect on western burrowing owl and impacts would be significant.

Mitigation Measures

Mitigation Measure BIO-TERR-1j: Avoid and Minimize Impacts on Western Burrowing Owl

The following measures, which were developed based on the *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game 2012), shall be implemented to avoid and minimize potential adverse impacts on burrowing owls prior to and during project construction and maintenance activities that require large areas of ground disturbance (e.g., grading).

- A qualified biologist will conduct preconstruction take avoidance surveys for burrowing owl 14 days prior to and a second survey within 24 hours of initiating ground-disturbing activities and before the filling of the reservoir. The survey area will encompass the work area and a 500-foot buffer around this area, as well as the inundation area. If no burrowing owls are found then no further mitigation would be required unless there is a lapse in time before the start of construction activities.
- To the maximum extent feasible, construction activities within 500 feet of active burrowing owl burrows will be avoided during the nesting season (February 1–August 31).
- If an active burrow is identified near a proposed work area and work cannot be conducted outside the nesting season (February 1–August 31), a no-activity zone will be established by a biologist experienced with burrowing owls in coordination with CDFW. The no-activity zone will be large enough to avoid nest abandonment and will extend a minimum of 250 feet around the burrow.
- If burrowing owls are present at the site during the nonbreeding season (September 1–January 31), a qualified biologist will establish a no-activity zone that extends a minimum of 150 feet around the burrow.
- If the designated no-activity zone for either breeding or non-breeding burrowing owls cannot be established, a wildlife biologist experienced in burrowing owl behavior will evaluate site-specific conditions and, in coordination with CDFW, recommend a smaller buffer (if possible) that still minimizes the potential to disturb the owls. The site-specific buffer will consider the type and extent of the proposed activity occurring near the occupied burrow, the duration and timing of the activity, the sensitivity and habituation of the owls, and the dissimilarity of the proposed activity to background activities.
- If burrowing owls are present in the direct disturbance area and cannot be avoided during the non-breeding season (generally September 1–January 31), passive relocation techniques (e.g., installing one-way doors at burrow entrances) may be used. Passive relocation may also be used during the breeding season (February 1–August 30) if a biologist with burrowing owl experience, coordinating with CDFW, determines through site surveillance and/or scoping that the burrow is not occupied by burrowing owl adults, young or eggs. Passive relocation will be accomplished by installing one-way doors (e.g., modified dryer vents or other CDFW approved method), which will be left in place for a minimum of 1 week and monitored daily to ensure that the owls have left the burrow. Excavation of the burrow will be conducted using hand tools. During excavation of the burrow, a section of flexible plastic pipe (at least 3 inches in diameter) will be inserted into the burrow tunnel to maintain an escape route for any animals that may be inside the burrow.
- Any owls in occupied burrows within the reservoir footprint shall be relocated using passive relocation techniques.
- Avoid destruction of unoccupied burrows outside the work area and place visible markers near burrows to ensure that they are not collapsed.
- Conduct ongoing surveillance of the project site for burrowing owls during project activities. If additional owls are observed using burrows within 500 feet of construction, the on-site biological monitor will determine, in coordination with CDFW, if the owl(s) are or would be affected by construction activities and if additional exclusion zones are required.

- If burrowing owls are detected during preconstruction surveys, the Project Partners will compensate for the loss of burrowing habitat according to the guidelines in *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game 2012). These guidelines do not recommend minimum habitat replacement ratios but do note that the conservation area should be comparable to or better than that of the impact area, of sufficiently large acreage, and should support burrowing mammals. Any such conservation may be combined with conservation areas that are developed for this project for Swainson's hawk and/or San Joaquin kit fox. If burrowing owl conservation is appropriate on these lands, the respective mitigation and monitoring plans developed for these areas will be modified to include measures for the maintenance and enhancement of habitat for burrowing owl.

Significance after Mitigation

Implementation of Mitigation Measures BIO-TERR-1a and BIO-TERR-1j would avoid, minimize, and compensate for effects on western burrowing owl, and would therefore reduce the impact on western burrowing owl to less than significant because the potential for injury and/or mortality would be avoided and minimized and any occupied habitat lost would be replaced.

Impact BIO-TERR-1k Impacts on Special-Status Birds and Nesting Migratory Birds

Construction Impacts

The relocation of Del Puerto Canyon Road, construction of the dams and associated reservoir facilities, and the realignment of the electrical and gas utilities would result in the permanent removal and temporary disturbance of habitat for special-status birds, including white-tailed kite, tricolored blackbird, grasshopper sparrow, loggerhead shrike, and golden eagle.

For white-tailed kite, the losses would include the permanent loss of 0.4 acre and temporary impacts on 2 acres of potential nesting habitat, and the permanent loss of 105 acres and temporary impacts on 529 acres of foraging habitat.

For tricolored blackbird and golden eagle, the project would result in the permanent loss of 105 acres and temporary impacts on 529 acres of foraging habitat. Construction would result in the permanent loss of 0.4 acre and temporary impacts on 2 acres of potential nesting habitat for golden eagle.

For loggerhead shrike, the project would result in the permanent loss of 38 acres and temporary impacts on 2 acres of potential nesting habitat and the permanent loss of 138 acres and temporary impacts on 530 acres of foraging habitat.

Construction activities associated with dam construction, the road realignment, and utility relocation could result in the disruption of nesting and foraging behaviors, injury, and/or mortality of eggs, nestlings, and/or adult birds if they are occupying the project areas during construction activities, such as grading, excavation, and the use of construction related vehicles, and from the use of artificial lighting during nighttime construction.

Operation Impacts

The filling of the reservoir would result in a permanent loss of nesting and foraging habitat for special-status birds.

For white-tailed kite, the losses would include the permanent loss of 17 acres of potential nesting habitat, and 748 acres of foraging habitat.

For tricolored blackbird and golden eagle, the project would result in the permanent loss of 748 acres of foraging habitat. The filling of the reservoir would also result in the loss of 56 acres of potential nesting habitat (16 acres of riparian woodland, 39 acres of blue oak woodland, and 0.4 acre of ornamental trees).

For loggerhead shrike, the project would result in the permanent loss of 81 acres of potential nesting habitat 822 acres of foraging habitat.

Maintenance activities, such as vegetation control, rodent control, erosion control, and associated vehicle traffic could result in the disruption of normal behaviors through noise and visual disturbance and result in the injury and/or mortality of special-status and nesting migratory birds if they are occupying upland areas where these activities are taking place and are exposed to chemicals used for some of these activities.

Lighting for the dam control house, inlet/outlet works control building, and bifurcation structure could disrupt normal behaviors of migratory and special-status birds if lighting spills over into adjacent habitats potentially resulting in a disruption in nesting and roosting.

The filling of the reservoir, which will take approximately 143 days, could result in the inundation of active nests that are on the ground, in shrubs, on structures, and/or in trees, which could result in the injury and/or mortality of eggs and nestlings.

Significance before Mitigation

Special-status birds with the potential to occur in the study area include white-tailed kite, tricolored blackbird, golden eagle, and loggerhead shrike. Loggerhead shrike was observed in flight during the wildlife surveys. Migratory birds have a potential to nest within the study area. The construction and operation of the proposed project would result in the permanent and temporary impacts on habitat for special-status birds and could result in the disruption of nesting behaviors and injury and/or mortality of special-status and migratory nesting birds. This loss and disruption would have a substantial adverse effect on special-status and nesting birds and impacts would be significant.

Mitigation Measures

Mitigation Measure BIO-TERR-1k: Avoid and Minimize Impacts on Nesting Birds

To the maximum extent practicable, the removal of structures and vegetation (trees, shrubs, and ground vegetation) shall take place during the non-breeding season for most migratory birds. This timing is highly preferable because if an active nest is found during preconstruction surveys in a tree (or other vegetation) that would be removed by project construction, the tree (or other vegetation) would not be allowed to be removed until the end of the nesting season or until the nestlings have fledged, which could delay construction. If vegetation cannot be removed during the non-nesting season, or if ground cover re-establishes in areas where vegetation has been removed, the affected area must be surveyed for nesting birds.

Should structure and vegetation removal activities occur between February 15 and September 30, a qualified biologist shall conduct preconstruction surveys for active nesting birds. If an active nest is found in the survey area, a no-disturbance buffer area will be established around the nest site to avoid disturbance or destruction of the nest until the end of the breeding season or until after a qualified wildlife biologist determines that the young have fledged and moved out of the project area (this timing varies by species). Buffers shall be developed by the biologist based on the species nesting behavior, their sensitivity to disturbance, the type or work taking place during the nesting season, and considering the surrounding topography and vegetation, which may attenuate noise and block visual disturbances. Buffers will be at a minimum of 50 feet from disturbance for more common ground nesting birds and a minimum of 500 feet for tree nesting raptors. Initial reservoir filling shall begin outside the nesting season.

Significance after Mitigation

Implementation of Mitigation Measures BIO-TERR-1a and BIO-TERR-1k would avoid and minimize effects on special-status birds and nesting migratory birds. These measures, together with the implementation of Mitigation Measures BIO-TERR-1m, which would help mitigate for the loss of foraging habitat and Mitigation Measure BIO-TERR-2 and BIO-TERR-5, which would mitigate for the loss of riparian habitat and blue oak woodland habitat that could be used for nesting, and Mitigation Measures ~~AES-4~~ AES-2 and ~~AES-5~~ AES-3, which minimize potential effects from construction and operational lighting, would reduce the impacts on special-status and nesting migratory birds to less than significant because the potential for disrupting nesting and the potential injury and/or mortality would be avoided and minimized, potential nesting habitat would be replaced, and suitable foraging habitat would be mitigated.

Impact BIO-TERR-1l Impact on Swainson's Hawk

Construction Impacts

The relocation of Del Puerto Canyon Road, construction of the dams and associated reservoir facilities, and the realignment of the electrical and gas utilities would result in the permanent loss of 0.4 acre and temporary impacts on 2 acres of potential nesting habitat and the permanent loss of 105 acres of suitable foraging habitat. These activities would also result in temporary impacts on 529 acres of suitable foraging habitat.

Visual and noise disturbances from construction activities associated with dam construction, the road realignment, and utility relocation could result in the disruption of nesting and foraging behaviors, injury, and/or mortality of eggs, nestlings, and/or adults if they are occupying the project areas during construction activities, such as grading, excavation, the use of construction related vehicles, the presence of construction personnel, and the use of artificial lighting.

Operation Impacts

The filling of the reservoir would result in a permanent loss of 17 acres of potential Swainson's hawk nesting habitat and 748 acres of suitable foraging habitat.

Maintenance activities, such as vegetation control, rodent control, erosion control, and associated vehicle traffic could result in the disruption of normal behaviors through noise and visual disturbance and result in the abandonment of an active nest resulting in the injury and/or mortality of eggs and nestlings.

Lighting for the dam control house, inlet/outlet works control building, and bifurcation structure could disrupt normal behaviors of Swainson's hawk if lighting spills over into adjacent habitats potentially resulting in a disruption in nesting and roosting.

Because trees would be removed before the reservoir is filled, the filling of the reservoir is not expected to result in the inundation of active nests.

Significance before Mitigation

Swainson's hawks were observed in the study area during the wildlife surveys and suitable nesting and foraging habitat is present in the study area. The construction and operation of the proposed project would result in the permanent loss of up to 17.4 acres and temporary impacts on 2 acres of potential nesting habitat and permanent impacts on up to 853 acres of suitable foraging habitat, and the temporary loss of up to 529 acres of foraging habitat. These activities could result in the disruption of normal behaviors and result in the injury and/or mortality of Swainson's hawk. These activities would have a substantial adverse effect on Swainson's hawk and impacts would be significant.

Mitigation Measures

Mitigation Measure BIO-TERR-1l: Avoid and Minimize Impacts on Swainson's Hawk

The Project Partners shall retain a wildlife biologist experienced in surveying for Swainson's hawk to conduct surveys for the species in the spring/summer prior to construction. The surveys shall be conducted within the limits of disturbance and in a buffer area up to 0.25 mile from the limits of disturbance. The size of the buffer area surveyed will be based on the type of habitat present and the line-of-sight from the construction area to surrounding suitable breeding habitat. Surveys shall follow the methods in Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee 2000). A minimum of six surveys shall be conducted according to these methods. If a variance of the survey distance or number of surveys is necessary, the Project Partners shall coordinate with CDFW regarding appropriate survey methods based on proposed construction activities. Surveys generally will be conducted from February to July. Survey methods and results will be reported to the Project Partners and CDFW.

Removal of trees within the reservoir inundation area shall take place outside the Swainson's hawk nesting season. Active Swainson's hawk nests within 600 feet of the areas of active construction activities shall be monitored by a wildlife biologist with experience in monitoring Swainson's hawk nests. The monitor shall document the location of active nests, coordinate with the Project Partners and CDFW, and record all observations in a daily monitoring log. The monitor shall have the authority to temporarily stop work if activities are disrupting nesting behavior to the point of resulting in potential take (i.e., eggs and young chicks are still in the nest, and adults appear agitated and could potentially abandon the nest). The monitor shall work closely with the contractor, the Project Partners, and CDFW to develop plans for minimizing disturbance, such as modifying or delaying certain construction activities.

A minimum non-disturbance buffer of 600 feet (radius) shall be established around all active Swainson's hawk nests. No entry of any kind related to construction will be allowed within this buffer while the nest is active, unless approved by CDFW through issuance of an Incidental Take Permit or through coordination during project construction. The buffer size may be modified based on site-specific conditions, including line-of-sight, topography, type of disturbance, existing ambient noise and disturbance levels, and other relevant factors. Entry into the buffer for construction activities shall be granted when the biological monitor determines that the young have fledged and are capable of independent survival, or that the nest has failed and the nest site is no longer active. All buffer adjustments shall be approved by CDFW.

Mitigation Measure BIO-TERR-1m: Compensate for the Loss of Swainson's Hawk Foraging Habitat

The permanent loss of Swainson's hawk foraging habitat will be mitigated according to the guidance in the *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (Buteo swainsoni) in the Central Valley of California* (California Department of Fish and Game 1994). This guidance includes recommended mitigation ratios based on the proximity to an active nest (used during one or more of the last 5 years preceding the initiation of the activity). As noted previously, a pair of Swainson's hawks was observed within the study area between the California Aqueduct and I-5 in May of 2019.

Significance after Mitigation

Implementation of Mitigation Measures BIO-TERR-1a, BIO-TERR-1lk, BIO-TERR-1l, and BIO-TERR-1m would avoid, minimize, and compensate for effects on Swainson's hawk. Mitigation Measure BIO-TERR-2 would mitigate for the loss of riparian habitat that could be used for nesting. Mitigation Measures ~~AES-4~~ AES-2 and ~~AES-5~~ AES-3 would minimize potential effects from construction and operational lighting. These measures would reduce the impact on Swainson's hawk to less than significant because the potential for disrupting nesting behaviors and the potential injury and/or mortality would be avoided and minimized, and potential nesting habitat and suitable foraging habitat would be replaced and mitigated, respectively.

Impact BIO-TERR-1m Impact on Special-Status and Non-Special-Status Bats

Construction Impacts

The relocation of Del Puerto Canyon Road and construction of the dam would result in permanent impacts on potential special-status and non-special-status bat species. Impacts on riparian woodland associated with the realignment of Del Puerto Canyon Road would permanently remove 0.4 acre and have temporary impacts on 2 acres of riparian woodland and ornamental trees that provides potential roosting habitat for western red-bat, pallid bat, and non-special status bats. Impacts on the rock outcrops for the construction of the dam would remove potential roosting habitat for pallid bat, western mastiff bat, and non-special-status bats.

The impacts on the rock outcrops and the removal of trees could result in the injury and/or mortality of roosting bats. Lighting, noise and vibrations associated would construction activities could disturb roosting bats and cause them to abandon roosts.

The culvert beneath I-5 where the roosting Mexican free-tailed bats were observed would not be removed or modified during construction.

Operation Impacts

The filling of the reservoir would result in a permanent loss of 17 acres of tree-roosting bat habitat and result in the loss of rock outcrops at the proposed dam site and at large rock outcrop along the south side of Del Puerto Canyon Road, which is located approximately 2.2 miles due west of I-5. The filling of the reservoir would also result in the loss of several abandoned structures that could be used as roosting habitat for bats.

The day to day operations and maintenance activities would not likely result in effects on special-status and non-special-status bats.

Significance before Mitigation

Special-status bats with the potential to roost and/or forage in the study area including pallid bat, western red bat, and western mastiff bat. Non-special-status bats also have a potential to roost and forage in the project area. The construction and operation of the proposed project would result in the loss potential special-status bat habitat and result in the potential injury and/or mortality of special-status bats and non-special-status bats. This loss would have a substantial adverse effect on special-status bats and impacts would be significant.

Mitigation Measures

Mitigation Measure BIO-TERR-1n: Avoid and Minimize Impacts on Bats

To avoid and minimize potential impacts on pallid bat, western red bat, and non-special-status bat species from the removal of trees and buildings, the Project Partners shall implement the following actions.

Preconstruction Surveys

Within 2 weeks prior to rock outcrop disturbance, tree removal, and any building demolition (e.g., sheds and other outbuildings), a qualified biologist shall examine rock outcrops to be disturbed, trees to be removed, and buildings planned for demolition for suitable bat roosting habitat. High-quality habitat features (e.g., deep crevices, large tree cavities, basal hollows, loose or peeling bark, larger snags, abandoned buildings) shall be identified, and the area around these features searched for bats and bat sign (e.g., guano, culled insect parts, staining). Riparian woodland and stands of mature broadleaf trees shall be considered potential habitat for solitary foliage-roosting bat species.

If suitable roosting habitat and/or bat sign is detected, biologists shall conduct an evening visual emergence survey of the source habitat feature, from a half hour before sunset to 1–2 hours after sunset for a minimum of two nights. Full-spectrum acoustic detectors shall be used during emergence surveys to assist in species identification. Detectors shall be set to record bat calls for the duration of each night. All emergence and monitoring surveys shall be conducted during favorable weather conditions (calm nights with temperatures conducive to bat activity and no precipitation predicted).

The biologist shall analyze the bat call data using appropriate software and prepare a report that will be submitted to the Project Partners and CDFW.

Timing of Rock Outcrop Disturbance, Tree Removal, and Building Demolition

Rock outcrops, trees, and buildings planned for removal and demolition shall have exclusion devices installed between September 15 and October 31 to avoid affecting maternal and hibernating bat roosts. The exact timing of removal and demolition shall be determined based on the results of preconstruction surveys of rock outcrops, trees, and buildings (i.e., if it is determined bats are present).

Protective Measures

Protective measures may be necessary if it is determined that bats are using rock outcrops, buildings or trees in the project footprint as roost sites, or if special-status bat species are detected during acoustic monitoring. The following measures shall be implemented when roosts are found within rock outcrops, trees, or buildings planned for removal according to the timing discussed above. Specific measures will be approved by the Project Partners and CDFW prior to excluding bats from occupied roosts.

- Exclusion from roosts will take place late in the day or in the evening to reduce the likelihood of evicted bats falling prey to diurnal predators and will take place during weather and temperature conditions conducive to bat activity.
- Biologists experienced with bats and bat evictions will carry out or oversee the exclusion tasks and will monitor rock outcrop disturbance, tree removal and building demolition if they are determined to be occupied.
- Trees that provide suitable roost habitat will be removed in pieces, rather than felling the entire tree and shall be done late in the day or in the evening to reduce the likelihood of evicted bats falling prey to diurnal predators, and will take place during warm weather conditions conducive to bat activity.
- Structural changes may be made to a known roost proposed for removal, to create conditions in the roost that are undesirable to roosting bats and encourage the bats to leave on their own (e.g., open additional portals so that temperature, wind, light and precipitation regime in the roost change). Structural changes to the roost will be authorized by CDFW and will be performed during the appropriate exclusion timing (listed above) to avoid harming bats.
- Non-injurious harassment at the roost site, such as ultrasound deterrents or other sensory irritants, may be used to encourage bats to leave on their own.
- One-way door devices will be used where appropriate to allow bats to leave the roost but not to return.
- Prior to rock outcrop disturbance, building demolition, and/or tree removal/trimming and after other eviction efforts have been attempted, any confirmed roost site will be gently shaken or repeatedly struck with a heavy implement such as a sledge hammer or an axe. Several minutes shall pass before beginning disturbance, demolition work, and felling trees to allow bats time to arouse and leave the roost. A biological monitor will search downed vegetation for dead and injured bats. The presence of dead or injured bats will be reported to CDFW. Injured bats will be transported to the nearest CDFW-permitted wildlife rehabilitation facility.

Significance after Mitigation

Implementation of Mitigation Measures BIO-TERR-1a and BIO-TERR-1n would avoid and minimize impacts on bats, and Mitigation Measure BIO-TERR-2 would replace riparian woodland. Mitigation Measures ~~AES-4~~ AES-2 and ~~AES-5~~ AES-3 would minimize potential effects from construction and operational lighting. These measures would therefore reduce the impact on bats to less than significant because the potential for disrupting roosting and the potential injury and/or mortality would be avoided and minimized and potential tree roosting habitat would be replaced.

Impact BIO-TERR-1n Impact on San Joaquin Kit Fox

Based on the size of the contiguous habitat in the project footprint, it is unlikely to provide a large enough home range to support occupancy of San Joaquin kit foxes. It is currently unknown where and how frequently San Joaquin kit fox may disperse through the study area. There are three CNDDB records in the region, one reported from the mouth of Del Puerto Canyon and two more that were reported as road mortality along I-5. Considering the Cypher et al. (2013) range wide habitat suitability data and the identification of suitable habitat in the project area that was done as part of this analysis, which are presented in **Figure 3.4-5** and **Figure 3.4-6,** respectively, the most likely movement corridor for San Joaquin kit fox is along the I-5 and California Aqueduct corridors. The toe of the dam, bifurcation structure, and spillway would be approximately 160 feet from the I-5 embankment at its narrowest, maintaining some degree of a north south corridor to the west of I-5. Currently the area west of I-5 between the ~~Del Puerto Canyon Road~~ Diablo Grande Parkway/Sperry Avenue ~~Road~~ overpass and the proposed dam is comprised of steep terrain and mostly abandoned orchard with a dense understory of herbs and grasses, which is not suitable for kit fox. The existing potential corridor immediately west of I-5 will not be substantially altered with the addition of the dam and infrastructure; however, if kit fox are using Del Puerto Canyon Road from I-5 heading west, then northwest to Del Puerto Canyon and then turning east to pass through the notch and on north, then the presence of the reservoir would remove that option for a movement corridor.

Construction Impacts

The relocation of Del Puerto Canyon Road, construction of the dams and associated reservoir facilities, and the realignment of the electrical and gas utilities would result in the permanent loss of 25 acres and temporary disturbance to 82 acres of potential San Joaquin kit fox habitat, which is primarily considered as dispersal habitat.

Construction activities associated with dam construction, the road realignment, and utility relocation could result in the disturbance of, injury, and/or mortality of San Joaquin kit fox if they are occupying or moving through the work area during construction activities, such as use of lighting, grading, excavation, and the use of construction related vehicles. Construction activities could also result in the exposure of San Joaquin kit fox to construction related fluids, such as fuels, oils, and cement, which could result in the injury and/or mortality of foxes.

Operation Impacts

The reservoir inundation would result in the permanent loss of 172 acres of low quality habitat and the presence of the dam and associated infrastructure between the dam and I-5 would result in the removal of potential San Joaquin kit fox dispersal habitat and create a barrier to the north-south movement of foxes, though movement would still be possible between the dam and I-5.

Maintenance activities, such as vegetation control, rodent control, erosion control, and associated vehicle traffic could result in the disruption of normal behaviors through noise and visual disturbance.

Lighting for the dam control house, inlet/outlet works control building, and bifurcation structure could disrupt normal behaviors of San Joaquin kit fox if lighting spills over into adjacent habitats potentially resulting in a disruption in foraging and dispersal activities.

Significance before Mitigation

The study area contains low quality habitat for San Joaquin kit fox but the easternmost edge may be used as dispersal habitat. The proposed project would result in the permanent loss of up to 197 acres and temporary effects on 82 acres of low quality habitat for San Joaquin kit fox. If San Joaquin kit fox are present, construction activities could result in injury or mortality to San Joaquin kit fox from vehicle collisions, entrapment in open trenches and pits, or destruction of an occupied den. The permanent loss of movement corridors and construction activities would have a substantial adverse effect on San Joaquin kit fox and impacts would be significant.

<u>Mitigation Measures</u>

Mitigation Measure BIO-TERR-1o: Avoid and Minimize Impacts on San Joaquin Kit Fox

The following measures have been adapted from the USFWS's *U.S. Fish and Wildlife Service Standard Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (Standard Recommendations) (U.S. Fish and Wildlife Service 2011). A qualified biologist shall conduct a preconstruction survey, within the limits of proposed temporary and permanent construction footprints in the habitat identified in Figure 3.4-5, <u>no less than 14 days and</u> no more than 30 days before the beginning of ground disturbance. The biologist shall conduct den searches by systematically walking transects spaced 30 to 100 feet apart through the action area. Transect distance shall be determined on the basis of the height of vegetation such that 100 percent visual coverage of the ground disturbing area is achieved. If dens are found during the survey, the biologist shall map the location of each den as well as record the size and shape of the den entrance; the presence of tracks, scat, and prey remains; and if the den was recently excavated. Dens shall be classified in one of the following four den status categories:

- Potential den: Any subterranean hole within the species' range that has entrances of appropriate dimensions for which available evidence is sufficient to conclude that it is being used or has been used by a San Joaquin kit fox (5 to 8 inches in diameter). Potential dens comprise: (1) any suitable subterranean hole; or (2) any den or burrow of another species (e.g., coyote, badger, red fox, or ground squirrel) that otherwise has appropriate characteristics for San Joaquin kit fox use.
- Known den: Any existing natural den or artificial structure that is used or has been used at any time in the past by a San Joaquin kit fox. Evidence of use may include historical records; past or current radio telemetry or spotlighting data; San Joaquin kit fox signs such as tracks, scat, and/or prey remains; or other reasonable proof that a given den is being or has been used by a San Joaquin kit fox.
- Natal or pupping den: Any den used by San Joaquin kit fox to whelp and/or rear their pups. Natal/pupping dens may be larger with more numerous entrances than dens occupied exclusively by adults. These dens typically have more San Joaquin kit fox tracks, scat, and prey remains in the vicinity of the den, and may have a broader apron of matted dirt and/or vegetation at one or more entrances. A natal den, defined as a den in which San Joaquin kit fox pups are actually whelped but not necessarily reared, is a more restrictive version of the pupping den. In practice, however, it is difficult to distinguish between the two; therefore, for purposes of this definition either term applies.
- Atypical den: Any artificial structure that has been or is being occupied by a San Joaquin kit fox. Atypical dens may include pipes, culverts, and diggings beneath concrete slabs and buildings.

If no potential dens are present no further avoidance measures would be required. If potential San Joaquin kit fox dens are present, their disturbance and destruction shall be avoided. Results of the survey shall be submitted to USFWS and CDFW within one week of the completion of the survey and prior to the beginning of ground disturbance and/or construction activities likely to affect San Joaquin kit fox. If dens are located within the project footprint, the following avoidance buffers shall be applied:

  - Potential den – 50 feet
  - Atypical den – 50 feet
  - Known Den – 100 feet
  - Natal/pupping den – USFWS and CDFW shall be contacted for further guidance

If the den is within the construction footprint and/or reservoir inundation area and if avoidance buffers are not possible, then dens may be collapsed following the guidance in the Standard Recommendations.

Additional avoidance and minimization measures identified in the Standard Recommendations shall be implemented during construction in suitable kit fox habitat.

Mitigation Measure BIO-TERR-1p: Compensate for the Loss of San Joaquin Kit Fox Dispersal Habitat

To compensate for the loss of potential kit fox dispersal habitat, the Project Partners shall obtain conservation easements on properties along the I-5/California Aqueduct corridors from Sperry Avenue ~~Road~~/Diablo Grande Parkway ~~Del Puerto Canyon Road~~ (at I-5) north to the area around Del Puerto Creek to improve San Joaquin kit fox dispersal habitat in this area. Suitable areas for conservation easements are located to the east of I-5 to the California Aqueduct or to the west of I-5 (in between I-5 and the proposed dam structure). Both areas currently have abandoned orchards with dense understories of herbs and grasses that are unusable for San Joaquin kit fox. Improvements may include but would not be limited to removing old orchards, implementing vegetation management to keep herbs and grasses short, improve conditions for ground squirrel colonization (e.g., remove thatch, discontinue rodent control measures), and provide artificial kit fox dens along this corridor. A final mitigation plan shall be developed with input from USFWS and CDFW during consultation with the agencies. The plan shall include measures for the long-term management of these lands for the benefit of San Joaquin kit fox dispersal and include adaptive management measures.

Significance after Mitigation

Implementation of Mitigation Measures BIO-TERR-1a, BIO-TERR-1o, and BIO-TERR-1p would avoid, minimize, and compensate for impacts on San Joaquin kit fox. Mitigation Measures ~~AES-4~~ AES-2 and ~~AES-5~~ AES-3 would minimize potential effects from construction and operational lighting. These measures would reduce the impact on the species to less than significant because they avoid and minimize the potential for disturbance, injury, and/or mortality, and mitigate effects on dispersal habitat by improving conditions along an existing potential corridor.

Impact BIO-TERR-1o Impact on American Badger

Construction Impacts

The relocation of Del Puerto Canyon Road, construction of the dams and associated reservoir facilities, and the realignment of the electrical and gas utilities would result in the permanent loss of 144 acres and the temporary disturbance to 531 acres of suitable habitat for American badger.

Construction activities associated with dam construction, the road realignment, and utility relocation could result in the disruption of normal behaviors, injury, and/or mortality of American badger if they are occupying dens in annual grasslands, coastal scrub, and blue oak woodlands during construction activities, such as grading, excavation, and the use of construction lighting and vehicles.

Operation Impacts

The filling of the reservoir would result in a permanent loss of 830 acres of potential American badger habitat and could decrease survivorship of badgers if they are displaced from their home range. The reservoir would also create a substantial barrier to the north-south movement of badgers in the region.

Maintenance activities, such as vegetation control, rodent control, erosion control, and associated vehicle traffic could result in the disruption of normal behaviors through noise and visual disturbance and result in the injury and/or mortality of American badger if they are occupying upland areas where these activities are taking place and are exposed to chemicals used for some of these activities.

Lighting for the dam control house, inlet/outlet works control building, and bifurcation structure could disrupt normal behaviors of American badger if lighting spills over into adjacent habitats potentially resulting in a disruption in foraging and dispersal activities.

Significance before Mitigation

Suitable American badger habitat occurs throughout the study area and signs of their use of the study area was observed. The construction and operation of the proposed project would result in the permanent loss of up to 973 acres and temporary effects on up to 530 acres of potential American badger habitat and result in the disruption of normal behaviors, potential injury, and/or mortality of American badger. This loss would have a substantial adverse effect on American badger and impacts would be significant.

Mitigation Measures

Mitigation Measure BIO-TERR-1q: Avoid and Minimize Impacts on American Badger

A qualified biologist shall conduct a preconstruction survey, within the limits of proposed temporary and permanent construction footprints, no more than 30 days before the beginning of ground disturbance. The biologist shall conduct den searches by systematically walking transects spaced 30 to 100 feet apart through the action area. Transect distance shall be determined on the basis of the height of vegetation such that 100 percent visual coverage of the ground disturbing area is achieved. If dens are found during the survey, the biologist shall map the location of each den as well as record the size and shape of the den entrance; the presence of tracks, scat, and prey remains; and if the den was recently excavated. If no dens are found no further mitigation is necessary.

If potential American badger dens are located within the proposed work area and cannot be avoided during construction, a qualified biologist shall determine if the dens are occupied or were recently occupied using remote cameras, media tracking, or methodology coordinated with CDFW. If unoccupied, the qualified biologist shall request permission from CDFW to temporarily plug the burrow entrance with sand bags to prevent badgers from re-using them during construction, and or if necessary, to collapse these dens by hand. If occupied, the biologist shall consult with CDFW regarding best practices for encouraging the badger(s) to move to alternate dens outside the work areas, including excavation or construction of artificial dens.

Significance after Mitigation

Implementation of Mitigation Measures BIO-TERR-1a and BIO-TERR-1q would avoid and minimize, impacts on American badger, and compensation in Mitigation Measures BIO-TERR-1m (Swainson's hawk compensation) and BIO-TERR-1p (San Joaquin kit fox corridors) would help offset the loss of habitat and impacts on dispersal corridors for American badger. Mitigation Measures ~~AES-4~~ AES-2 and ~~AES-5~~ AES-3 would minimize potential effects from construction and operational lighting These measures would reduce the impact on the American badger to less than significant because they avoid and minimize the potential for disturbance, injury, and/or mortality, and compensate for the loss of habitat.

Impact BIO-TERR-2 Substantial Adverse Effect on Riparian Habitat or Other Sensitive Natural Community

Construction Impacts

The proposed project could result in permanent loss of 0.2 acre of riparian woodland along Del Puerto Creek from construction of the road relocation.

Operation Impacts

The proposed project could result in direct permanent loss of riparian habitat along Del Puerto Creek and along one tributary to Del Puerto Creek, including 16.3 acres of riparian woodland and 19.2 acres of riparian wetlands, from inundation of the reservoir.

Significance before Mitigation

The construction and operation of the proposed project would result in the permanent removal of over 16 acres of riparian woodland and 19 acres of riparian wetlands. This loss would have a substantial adverse effect on riparian habitat and impacts would be significant

Mitigation Measures

Mitigation Measure BIO-TERR-2: Compensate for Effects on Riparian Habitat or Other Sensitive Natural Community.

Riparian habitat shall be created or acquired and permanently protected to compensate for project effects to ensure no net loss of riparian habitat functions and values. Land that could be acquired could include acres upstream of the reservoir or elsewhere that satisfied appropriate compensation ratios. Compensation ratios shall be based on site-specific information and determined through coordination with state and federal agencies (CDFW, USFWS, USACE, SWRCB). The compensation shall be at a minimum 1:1 ratio (1 acre restored or created for every 1 acre filled) and may be a combination of offsite restoration/creation and mitigation credits. A restoration and monitoring plan shall be developed and implemented concurrently with project construction. The plan shall describe how riparian habitat will be created and monitored, including funding mechanisms and appropriate long-term management measures, and agency reporting requirements.

Significance after Mitigation

Successful implementation of this mitigation measure would replace the riparian habitat functions and values lost as a result of project implementation and would reduce impacts on riparian habitat to less than significant.

Impact BIO-TERR-3 Substantial Adverse Effect on State or Federally Protected Wetlands

Construction Impacts

The proposed project could result in the permanent loss of 0.1 acre of ponds from construction of the road relocation.

Operation Impacts

The proposed project could result in the permanent loss of 31.1 acres of riparian wetlands along Del Puerto Creek, 0.6 acres of riparian wetlands associated with the unnamed tributary to Del Puerto Creek, 1.7 acre of seeps, 0.1 acre of seasonal wetlands, and 0.2 acre of ponds due to inundation of the proposed reservoir.

Significance before Mitigation

The construction and operation of the proposed project would result in the permanent loss of over 32 acres of riparian wetlands, seeps, seasonal wetlands, and ponds. This loss would have a substantial adverse effect on state or federally protected wetlands and impacts would be significant impact.

Mitigation Measures

Mitigation Measure BIO-TERR-3: Compensate for Adverse Effects on State or Federally Protected Wetlands

Suitable wetland habitat shall be created or acquired and permanently protected to compensate for project effects to ensure no net loss of wetland habitat functions and values. Compensation ratios shall be based on site-specific information and determined through coordination with state and federal agencies (CDFW, USFWS, USACE, SWRCB). The compensation shall be at a minimum 1:1 ratio (1 acre restored or created for every 1 acre filled) and may be a combination of offsite restoration/creation and mitigation credits. A restoration and monitoring plan shall be developed and implemented. The plan shall describe how wetland ~~riparian~~ habitat will be created and monitored, including funding mechanisms and appropriate long-term management measures, and agency reporting requirements.

Significance after Mitigation

Creation of suitable wetland habitat would replace the habitat functions and values that would be lost as a consequence of the project implementation and would reduce this impact to less than significant.

Impact BIO-TERR-4 Interference with the Movement of Native Resident or Migratory Wildlife Species or Established Native Resident or Migratory Wildlife Corridors or Use of Native Wildlife Nursery Sites.

The following analysis addresses the project potential effects on the movement of native wildlife species and wildlife corridors. Section 3.5, *Biological Resources – Fish,* of this EIR addresses potential effects on the movement of native resident and/or migratory fish. No native wildlife nursery sites were identified during the review of existing data sources or as a result of the reconnaissance level surveys.

Construction Impacts

Proposed project construction, including road relocation and construction of dams and related facilities, could cause habitat loss and fragmentation, wildlife avoidance behavior due to construction-related habitat loss, noise, traffic, and other disturbances, and wildlife-vehicle collisions. These behaviors typically attributed to construction have substantial negative impacts on wildlife populations (Forman et al. 2003; Jacobson et al. 2016 and references therein). Direct construction impacts would include temporary habitat and vegetation removal and permanent loss of habitats and lands designated as high-value wildlife corridors by various entities identified in Section 3.4.1, Environmental Setting, Wildlife Corridors (e.g., ACE). Wildlife movement and habitat connectivity throughout the study area would be temporarily affected during construction activities because of habitat and vegetation removal and increased human presence and construction activity as well as indirectly via noise, dust, light, reduced water quality, edge effects, and vibration associated with construction. Existing wildlife corridors and connectivity areas overlapping with the study area would be affected during construction. These corridors include the San Joaquin Valley Wildlife Corridors, **Figure 3.4-7**, UC Davis Core Reserves and Corridors, **Figure 3.4-8**, ACE program Connectivity Ranking, **Figure 3.4-9**, Bay Area and Beyond Critical Linkages, **Figure 3.4-10**, and the California Essential Habitat Connectivity Project connectivity areas, **Figure 3.4-11**. This may result in temporary movement obstructions and wildlife avoiding use of these areas for daily and seasonal movement. Avoidance of and decreased or changed movement through these areas may result in temporary population fragmentation, habitat avoidance, and increased potential for avoidance of existing corridors, as well as potential increased risk of wildlife/vehicle collisions for animals passing over a roadbed or being struck by construction equipment (Forman and Alexander 1998; Blickley and Patricelli 2010; Van Der Ree et al. 2015; Bliss-Ketchum et al. 2016; Jacobson et al. 2016). These types of construction related impacts are anticipated to affect a wide variety of species and habitats that occur within the vicinity of the study area such as species listed in Appendix B2, *Species Observed in the Study Area,* and B4, *Special-Status Species Tables*.

Operation Impacts

Operation of the proposed project would result in indirect permanent impacts, such as increased disturbance and human presence within the proposed project area related to facility operation and maintenance; including increased human presence, noise, light, and edge effects.

The filling of the reservoir would present a large permanent obstruction to wildlife connectivity and movement and would be impassable to many species of terrestrial wildlife. The reservoir itself would be impassable to many species of terrestrial wildlife and would eliminate existing live-in habitat which serves as the basis for connectivity of low mobility fauna.

Road operation would result in wildlife road avoidance behavior, noise, traffic, edge effects and other disturbances, and wildlife-vehicle collisions. While the new roadway would remove habitat and present wildlife-roadway conflicts, the magnitude of effects is not expected to exceed existing conditions because there is an existing roadway and the old roadway area would become submerged with the filling of the proposed reservoir.

The combined effect of the reservoir and the roadway relocation would result in changes to wildlife movement and wildlife conflict in the study area. Wildlife display a variety of behavioral responses when encountering human developments and roadways, which include habitat, roadway, and roadside habitat avoidance, and altered movement patterns and behavior, all of which may change because of the proposed reservoir and road operation. The reservoir may interfere with wildlife movement in the region causing changed behavior and dispersal patterns which have the potential to increase wildlife-vehicle collisions along the relocated roadway. For example, wildlife moving and dispersing north would be unable to pass the reservoir, and may be more likely to move back and forth over the relocated roadway while attempting to navigate and move through the region due to the roadway's proximity to the reservoir which creates a fragmented swath of land between the reservoir and the relocated roadway. This may increase the frequency of wildlife passing over the roadway in the region resulting in increased wildlife-vehicle collisions.

Significance before Mitigation

Because the proposed project would directly and permanently fragment important wildlife corridors in the region and has potential to increase wildlife mortality due to wildlife-vehicle collisions, the proposed project would have a substantial adverse effect on the movement of native wildlife species and wildlife corridors and these impacts would be significant.

Mitigation Measures

Mitigation Measure BIO-TERR-4a: Implement Wildlife Crossings

Wildlife crossings and directional wildlife fencing will be incorporated into the new roadway. Crossings shall be composed of bridges and oversized culverts where possible. At all cut/fill locations, wildlife crossing will be considered; pre-engineered, prefabricated structures will be considered in lieu of fill. Crossings shall maximize structure height as much as possible to maximize openness and structure function for a wide range of species including larger ungulates and species which prefer large crossing. Larger structures shall be a minimum of 15 feet in height. Wildlife crossings and fencing shall be designed using the most up-to-date road ecology and wildlife crossing manuals and handbooks.

Mitigation Measure BIO-TERR-4b: Wildlife Corridor Preservation and Enhancement

Wildlife connectivity and habitat between the proposed project and I-5 shall be conserved to the maximum extent possible in order to preserve a wide swath of habitat between I-5 and the proposed project. The conserved land shall be as wide as possible and shall incorporate habitat heterogeneity in order to facilitate the movement for a broad range of species.

Mitigation Measure BIO-TERR-4c: Roadway Wildlife Crossing Signage

Non-standard wildlife crossing warning signs shall be installed to alert and educate drivers to maintain the speed limit and stay alert for wildlife crossing the roadway. The signs shall engage drivers by providing explicit instructions. Flashing lights may also be used to draw driver attention to the signs.

Significance after Mitigation

Implementation of Mitigation Measures BIO-TERR-4a and Mitigation Measures BIO-TERR-4c will help to maintain movement ability of native wildlife species and wildlife corridors through the proposed project area. With the implementation of the mitigation measures, impacts would be less than significant because they would avoid and minimize vehicle collisions and maintain the ability for wildlife to move through the region.

Impact BIO-TERR-5 Conflict with Local Policies or Ordinances Protecting Biological Resources

Construction Impacts

The Stanislaus County General Plan contains several policies (listed in Section 3.4.2, Regulatory Framework) regarding the protection of sensitive biological resources. The General Plan policies require mitigation measures for impacts on sensitive species and habitats, such as riparian habitats and vernal pools, and a management plan for the protection and enhancement of oak woodlands for discretionary projects that would potentially impact oak woodlands. Seasonal wetlands, riparian habitats, and sensitive species are present in the study area, and the proposed project would result in impacts to these resources, as discussed in Impacts BIO-TERR-1, BIO-TERR-2, and BIO-TERR-3. These discussions also include mitigation for these resources. Because the General Plan requires mitigation measures for impacts on sensitive species and habitat, the proposed mitigation would avoid a conflict with the goals of the plan. Blue oak woodland, however, is present in the study area and would be affected by the road relocation, resulting in the loss of 19 acres of this specific resource.

Operation Impacts

The filling of the reservoir would result in the loss of habitat for sensitive species, seasonal wetlands, and riparian habitats, which are discussed in Impacts BIO-TERR-1, BIO-TERR-2, and BIO-TERR-3, including proposed mitigation. The proposed mitigation measures would align with goals of the General Plan in that they would require mitigation for impacts on sensitive species and habitat. However, the filling of the reservoir would also result in the loss of 20 acres of blue oak woodland.

Significance before Mitigation

A total of approximately 39 acres of blue oak woodlands would be lost as a result of the proposed project. Absent mitigation, this loss would be in conflict with the General Plan goals to protect and enhance oak woodlands and would be considered a significant impact.

Mitigation Measure

Mitigation Measure BIO-TERR-5: Develop a Management Plan for the Protection and Enhancement of Oak Woodlands

Per Policy 4, 4.1, of the Stanislaus County General Plan, the Project Partners shall develop and implement a management plan for the protection and enhancement of oak woodlands to offset the loss of oak woodlands from the project. This plan will include measures for the protection, management, and enhancement of oak woodlands on lands that are acquired for the development of the reservoir but that are above the high-water line for the reservoir. A minimum of 1 acre of oak woodland shall be preserved, managed, and monitored for every acre of oak woodland lost as a result of project implementation.

Significance after Mitigation

Implementation of mitigation measures for impacts on sensitive habitats and species described under the discussions in Impacts BIO-TERR-1, BIO-TERR-2, and BIO-TERR-3, and in Mitigation Measure BIO-TERR-5 would avoid conflicts with the policies in the General Plan. The resulting impact would be less-than-significant.

Impact BIO-TERR-6 Conflict with Adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other Approved Local, Regional, or State Habitat Conservation Plan

Construction Impacts

The proposed project is located within the plan area for the PG&E San Joaquin Operation & Maintenance HCP (PG&E HCP) (Jones & Stokes 2006), but does not overlap with the plan area for any NCCP or other approved local, regional, or state habitat conservation plan. The PG&E HCP covers only PG&E-related operation and maintenance and minor construction activities. The PG&E HCP does not cover any proposed project activities (including the relocation of transmission lines requested by others). The construction of the proposed project will not conflict with provisions of the HCP.

Operation Impacts

Similar to the construction impacts, operation of the proposed project would not conflict with existing HCPs, NCCPs, or other conservation plans.

<u>Significance before Mitigation</u>

The study area does not overlap with the plan area for any NCCP or other approved local, regional, or state habitat conservation plan. The PG&E HCP does not cover any proposed project activities and the proposed project will not conflict with provisions of the HCP. Therefore, the project will have no impact and mitigation measures are not required.

Impact BIO-TERR-7 Spread invasive plant species such that there would be a substantial effect on special-status species, sensitive communities, or wetlands

Construction and Operation Impacts

Introduction or spread of invasive species into the project area during construction activities would not have a substantial adverse effect on special-status species, sensitive natural communities, or wetlands, because these resources would be permanently removed by the proposed project, as identified in BIO-TERR-1, BIO-TERR-2 and BIO-TERR-3. If there were spread of invasive plant species during the construction phase, they would be inundated along with the other plants and habitats under reservoir operations. There are no on-water recreation facilities proposed, so spread of aquatic invasive plant species would not occur via recreation. Finally, the invasive plant species identified in Appendix B3 are also very common and widespread to California and the Central Valley; therefore, there is a relatively low likelihood they would spread from the study area to places where they are not present to have an effect on sensitive terrestrial resources.

<u>For those areas that would not be inundated (adjacent to the spillway or the DMC), as described in Chapter 2, Section 2.4.4 once construction of the dam facilities are complete areas would be revegetated and Section 2.3.3, Maintenance of the proposed project facilities would include vegetation control. Standard vegetation control includes:</u>

- <u>Regular monitoring of area around proposed facilities adjacent to the DMC and at the base of the reservoir.</u>
- <u>Identification of non-native weeds around proposed facilities and control of non-native weeds through hand or mechanical removal and/or chemical treatment.</u>
- <u>Management of upland areas to control non-native weeds around the reservoir by maintaining grazing for control of invasive weeds on upland areas and targeted grazing refocusing outputs of grazing from livestock production to vegetation management and landscape enhancement. Specific targeted grazing regimes will need to be developed on a case-by-case basis as infestations of invasive weeds are identified. Livestock will be excluded from areas of the restoration site not targeted for grazing with temporary livestock fencing</u>

The proposed project therefore includes vegetation control that would limit the spread and introduction of invasive species around proposed facilities that are not inundated.

Significance before Mitigation

The construction and operation of the proposed project would not result in the substantial spread of invasive plant species or effects on special-status species, sensitive communities or wetlands because such species would be previously removed and eventually inundated, there are no proposed on-water recreational opportunities, and the widespread nature of existing invasive plant species in the Region. Impacts would be less than significant.

Mitigation Measures

None.

Cumulative Impact Analysis

The geographic scope of the cumulative impacts on terrestrial resources encompasses the study area and surrounding areas. If the proposed project, as well as other projects listed in **Table 3.0-1**, would adversely affect the same terrestrial resources, they could result in significant cumulative impacts on terrestrial resources of the area.

The proposed project would incrementally contribute to cumulatively considerable impacts because of the temporary and permanent loss of habitat and disruption of wildlife corridors described in Impacts BIO-TERR-1a through 1o, BIO-TERR-2, BIO-TERR-3, and BIO-TERR-4.

There are three projects identified on **Table 3.0-1** that could result in potentially significant impacts to terrestrial biological resources and contribute to the cumulative effects of the overall decline of species in the Central Valley. The proposed transmission line relocation would likely affect similar habitat and species as those affected by the proposed project because it would be located adjacent to the proposed project. The stormwater capture project may also permanently or temporarily affect habitat and species depending on the construction of infrastructure and where it may be located along Del Puerto Creek. The location of the stormwater capture project has not been determined but is likely to be in existing agricultural land in or adjacent to the City of Patterson, where natural habitat is limited; it is thus not expected to combine with the proposed project to result in impacts on similar types of habitat. The proposed West Patterson Business Park Expansion would develop the corridor in between I-5 and the DMC with light industrial and commercial uses. This proposed development would reduce the ability of the kit fox to disperse via north-south corridors along I-5 and the California Aqueduct, in combination with the proposed project. This development not only would contribute to cumulatively considerable impacts on kit fox dispersal habitat, but it would limit the feasibility of implementing proposed Mitigation Measure BIO-1p. Given the overall decline of species and the similar types of impacts that the proposed transmission line and the West Patterson Business Park Expansion would have on species and habitat that the proposed project is affecting, impacts would be cumulatively considerable and significant.

Significance Determination

The incremental contribution of the proposed project would be significant, and impacts would be cumulatively considerable prior to the implementation of mitigation measures identified in this section. As such, the proposed project, combined with other projects, would result in a significantly cumulatively considerable impacts to species identified as a candidate, sensitive, or special status species, riparian habitat or other sensitive natural community. However, with implementation of the following mitigation measures, the proposed project contribution would be less than significant because the measure would either avoid impacts, compensate for impacts, or replace habitat.

Mitigation Measures

Implement the following Mitigation Measures:

- Mitigation Measure BIO-TERR-1a Avoid and Minimize Impacts on Biological Resources
- Mitigation Measure BIO-TERR-1b: Avoid and Compensate for Adverse Effects on Special-Status Plant Species Where Temporary Ground-disturbing Activities Would Take Place
- Mitigation Measure BIO-TERR-1c: Compensate for the loss of habitat occupied by vernal pool fairy shrimp and/or vernal pool tadpole shrimp
- Mitigation Measure BIO-TERR-1d Avoid, Minimize, and Compensate for Impacts of Valley Elderberry Longhorn beetle:
- Mitigation Measure BIO-TERR-1e: Avoid and Minimize on Special-Status Amphibians
- Mitigation Measure BIO-TERR-1f: Compensation for the loss of California Tiger Salamander Habitat
- Mitigation Measure BIO-TERR-g: Compensate for the Loss of California Red-legged Frog Habitat
- Mitigation Measure BIO-TERR-1h: Compensate for the Loss of Foothill Yellow-legged Frog Habitat
- Mitigation Measure BIO-TERR-1i: Avoid and Minimize Impacts on Special-Status Reptiles
- Mitigation Measure BIO-TERR-1j: Avoid and Minimize Impacts on Western Burrowing Owl
- Mitigation Measure BIO-TERR-1k: Avoid and Minimize Impacts on Nesting Birds
- Mitigation Measure BIO-TERR-1l: Avoid and Minimize Impacts on Swainson's Hawk
- Mitigation Measure BIO-TERR-1m: Compensate for the Loss of Swainson's Hawk Foraging Habitat
- Mitigation Measure BIO-TERR-1n: Avoid and Minimize Impacts on Bats
- Mitigation Measure BIO-TERR-1o: Avoid and Minimize Impacts on San Joaquin Kit Fox
- Mitigation Measure BIO-Terr-1p: Compensate for Loss of San Joaquin Kit Fox Dispersal habitat
- Mitigation Measure BIO-TERR-1q: Avoid and Minimize Impacts on American Badger
- Mitigation Measure BIO-TERR-2: Compensate for Effects on Riparian Habitat or Other Sensitive Natural Community.
- Mitigation Measure BIO-TERR-3: Compensate for Adverse Effects on State or Federally Protected Wetlands
- Mitigation Measure BIO-TERR-4a: Implement Wildlife Crossings.
- Mitigation Measure BIO-TERR-4b: Wildlife Corridor Preservation and Enhancement.
- Mitigation Measure BIO-TERR-4c: Roadway Wildlife Crossing Signage.
- Mitigation Measure BIO-TERR-5: Develop a Management Plan for the Protection and Enhancement of Oak Woodlands

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3.5 Biological Resources—Fish

This section evaluates potential impacts on aquatic biological resources associated with implementation of the proposed project. Aquatic biological resources are defined as fish species and aquatic habitat in the vicinity of the facilities to be constructed or modified under the proposed project (study area) as well as those species and aquatic habitat that may be affected by project operations downstream of the study area, in the San Joaquin River and Sacramento-San Joaquin Delta (Delta). The potential for a species to occur in the study area and San Joaquin River and Delta was determined from a records search of the California Natural Diversity Database (California Department of Fish and Wildlife 2019) and U.C. Davis' PISCES database (California Fish Database), published accounts of species distributions and habitat requirements, direct observations through a field visit May 6 and 7, 2019, and using an underwater video camera during a reconnaissance survey of Del Puerto Creek on July 22, 2019.

3.5.1 Environmental Setting

Definitions

This evaluation describes potential impacts to special-status fish species from the proposed project. Special-status species include federal and state-listed endangered, threatened, and candidate species, federal species of concern, state species of special concern, and species of management concern.

Study Area

Del Puerto Creek is an intermittent stream that is tributary to the San Joaquin River and is located within the Sacramento-San Joaquin River Basin. Flow is highly variable, occurring mainly during the winter months when the majority of annual rainfall occurs. The creek is often dry between rain events. Surface flows generally cease by the late spring or summer, although there can be some ponding and flow, depending on location and hydrology. The lower reach, downstream of Interstate 5 (I-5) may continue to be supplied by irrigation water (return flow from surrounding croplands) during the dry season.

Lower Del Puerto Creek (downstream of proposed dam and inundation area) has been highly altered from historical conditions by road infrastructure (e.g., highway and canal crossings), losses of riparian and wetland vegetation, agricultural return flows, and water quality degradation. Historical and ongoing physical disturbances have resulted in a simple conveyance channel with little cover **(Figure 3.5-1**). Intensive agricultural activities have altered water and sediment quality in lower Del Puerto Creek, with pesticide concentrations sometimes reaching levels acutely toxic to sensitive invertebrates (Weston et al. 2008, Ensminger et al. 2009, Hall and Anderson 2018). Although agricultural return flows during the summer irrigation season generally provide more stable flow conditions than historically existed within lower Del Puerto Creek, these conditions do not likely support native fish species because of their sensitivity to water quality degradation and presence of introduced species that typically characterize low elevation tributary and mainstem reaches of the San Joaquin River (Brown 2000). Fish species that can potentially maintain resident populations in lower Del Puerto Creek are small introduced species that can tolerate the harsh environmental conditions associated with agricultural return flows and poor water quality during the summer irrigation season. These species include fathead minnow, green sunfish, and red shiner, although other species that require permanent bodies of water (e.g., catfish, common carp) may periodically enter Del Puerto Creek from the San Joaquin River or local irrigation channels (Brown 2000).

Figure 3.5-1: Lower Del Puerto Creek Above Highway 33 and Downstream of I-5

Photo taken May 6, 2019.

Upstream of the proposed dam site, the stream channel has been altered by grazing, roads, and other historic land uses (e.g., orchards and grazing). Much of the channel within the lower reservoir inundation area is characterized by an exposed, shallow channel bordered by open grassland. During the dry season, Del Puerto Creek within this area provides limited fish habitat because of little or no surface flow and lack of channel complexity or cover. In May 2019, following a relatively wet winter and spring, flowing water was still present but much of the stream was characterized by shallow, warm water with extensive filamentous algae (**Figure 3.5-2**).

Figure 3.5-2:Del Puerto Creek about 2 Miles West of I-5

Photo taken May 8, 2019.

Within the upper, higher gradient reaches of Del Puerto Creek, including the upper portion of the proposed reservoir inundation area, several areas exist where subsurface flow and seeps maintain isolated pools and riparian and wetland vegetation (**Figure 3.5-3)**. In July 2019, underwater video observations within one of these pools revealed the presence of large concentrations of juvenile pikeminnow (*Ptychocheilus grandis*) and smaller numbers of juvenile and adult suckers (*Catostomus occidentalis*). Based on general species distributions and associations, other native species that may co-occur with Sacramento pikeminnow and Sacramento suckers include hardhead (*Mylopharodon conocephalus*), California roach (*Lavinia symmetricus*), riffle sculpin (*Cottus gulosus*), and rainbow trout (*Oncorhynchus mykiss*) (Moyle 2002, p. 27). The presence or absence of these species could not be confirmed. Rainbow trout and riffle sculpin are not likely to occur because of their requirement for permanent, cool streams. Steelhead (sea-run rainbow trout) are also not likely to occur because of presumed migration barriers in lower Del Puerto Creek (culverts underneath the California Aqueduct and Interstate 5). Although upper Del Puerto Creek above the proposed inundation area was identified as historically providing suitable habitat for steelhead based on general watershed characteristics (Lindley et al. 2006), the watershed has not been designated as critical habitat or included in the NMFS recovery plan (NMFS 2014).

Figure 3.5-3: Del Puerto Creek About 3 Miles West of I-5

Photo taken on May 8, 2019.

A recent study documented the importance of Del Puerto Creek as a major source of gravel to the lower San Joaquin River between the Merced and Stanislaus rivers, and to the maintenance of spawning habitat for white sturgeon (*Acipenser transmontanus*) (Marineau et al. 2017). Adult white sturgeon are known to occur in the San Joaquin River, but successful spawning was only recently demonstrated by the capture of eggs and larvae between 2011 and 2016 (Jackson et al. 2016). White sturgeon typically spawn in deep water over gravel substrates or in rocky pools with swift currents (Moyle et al. 2015). Surveys of the physical characteristics of selected spawning reaches between 2011 and 2014 detected large quantities of gravel downstream of Del Puerto Creek on bars and in the adjacent bed of the sand-dominated San Joaquin River. Bed-material sampling in Del Puerto Creek and Orestimba Creek indicated that Del Puerto Creek was the primary source for this gravel (Marineau et al. 2017).

Special-Status Fish Species

Two state identified special-status fish species (California species of special-concern) are determined to have the potential to occur in the Del Puerto Creek within the study area (hardhead and California roach) based on their general distribution, habitat requirements, and association with other native species that are known to occur in Del Puerto Creek. The general distribution and habitat requirements of these two species relative to Del Puerto Creek's conditions are described below. In addition, there are several other special-status species and species of management concern that use the lower San Joaquin River downstream from Del Puerto Creek for migration, spawning, and rearing. These species are also identified below.

Hardhead

Hardhead (*Mylopharodon conocephalus*) are a member of the minnow family (Cyprinidae) and are similar in appearance to the Sacramento pikeminnow (Moyle 2002, p. 151). Hardhead exist throughout the Sacramento-San Joaquin River Basin and are common in the Sacramento River and tributaries, but in other parts of their range, populations have declined or have become increasingly isolated (Moyle 2002, p. 153). Hardhead tend to be absent from areas that have been highly altered or that are dominated by introduced fish species, especially centrarchids (black bass and sunfish) (Moyle et al. 1995). Hardhead can inhabit reservoirs and are abundant in a few impoundments where water level fluctuations prevent bass from reproducing in large numbers (Moyle 2002, p. 153). Hardhead are omnivorous; their diet consists mostly of benthic invertebrates and aquatic plants, but also includes drifting insects. In reservoirs, hardhead also prey upon zooplankton (Moyle et al. 1995). Hardhead spawn mainly in April and May and may migrate from larger rivers or reservoirs to spawn in tributary streams. Spawning behavior has not been documented, but it is assumed to be similar to that of the pikeminnow, which deposit their eggs in flowing, gravel-bed stream areas (Moyle et al. 1995).

Central California Roach

California roach (*Lavinia symmetricus*) is a California Species of Special Concern (Moyle et al. 2015). The Central California Roach, a subspecies, is found in tributaries to the San Joaquin River (e.g., Del Puerto Creek). Evidence suggests that Central California roach are declining in the Central Valley (Moyle et al. 2015). Roach have been largely eliminated from streams that have been highly altered by agricultural and urban development, and in streams and reservoirs that are dominated by introduced fish species (Moyle et al. 1995). Roach are primarily benthic feeders, feeding on filamentous algae, crustaceans, aquatic insects, and detritus (Moyle et al. 2015). Spawning typically occurs with increasing water temperatures in March through early July. Roach spawn in large groups in riffles over coarse substrates. Roach have wide environmental tolerances as evidenced by their occupation of habitats ranging from cold, clear trout streams to intermittent streams where they can survive extremely high temperatures and low dissolved oxygen (Moyle et al. 1982). California roach are particularly well adapted to intermittent watercourses, often occurring in large numbers in isolated pools (Moyle et al. 1982), suggesting that Del Puerto Creek provides potential habitat for this species.

Species Downstream of the Confluence of Lower San Joaquin River and Del Puerto Creek

The San Joaquin River supports a number of other special-status species and species of management concern that use the lower San Joaquin River downstream from Del Puerto Creek for migration, spawning, and rearing (**Table 3.5-1**). This San Joaquin River downstream of Del Puerto Creek is designated as critical habitat for threatened California Central Valley steelhead.

Table 3.5-1: Special-Status Species and Species of Management Concern in the San Joaquin River

Common Name	Scientific Name	Status
California Central Valley Steelhead DPS	*Oncorhynchus mykiss*	Threatened
Central Valley Spring-Run Chinook Salmon ESU	*Oncorhynchus tshawytscha*	Non-Essential Experimental Population[1]
Central Valley Fall-Run Chinook Salmon ESU	*Oncorhynchus tshawytscha*	Federal Species of Concern; California Species of Special Concern
White Sturgeon	*Acipenser transmontanus*	California Species of Special Concern
Pacific Lamprey	*Entosphenus tridentatus*	California Species of Special Concern
Sacramento Splittail	*Pogonichthys macrolepidotus*	California Species of Special Concern
Western River Lamprey	*Lampetra ayresi*	California Species of Special Concern
Striped Bass	*Morone saxatilis*	Species of Management Concern
American Shad	*Alosa sapidissima*	Species of Management Concern
Black Bass	*Micropterus* spp.	Species of Management Concern

[1] NMFS designated spring-run Chinook salmon in the San Joaquin River as a non-essential experimental population to allow reintroduction of the species between Friant Dam and the confluence with the Merced River as part of the San Joaquin River Restoration Program (78 FR 251; December 31, 2013).

3.5.2 Regulatory Framework

Federal Policies and Regulations

See *Section 3.4*, *Biological Resources – Terrestrial*, *Section 3.4.2*, *Regulatory Framework*, for a description of federal, state, and local policies and regulations pertaining to terrestrial and aquatic biological resources.

3.5.3 Impact Analysis

Methodology for Analysis

The assessment of potential impacts to fish resources consisted of a qualitative evaluation of construction and operation effects of the project facilities. The impact assessment addressed two primary impact types: (1) temporary and localized impacts associated with construction of the project facilities; and (2) long-term impacts associated with operation and maintenance of project facilities.

The impact analysis includes the following key assumptions:

- Environmental commitments described in *Chapter 2*, *Description of the Proposed Project*, *Section 2.4.10*, *Environmental Commitments*, as part of the proposed project would be implemented;
- As described in *Section 2.3, Operations and Maintenance*, proposed project operations would be consistent with the Coordinated Operation Agreement for the State Water Project and Central

Valley Project (CVP) and would not affect existing CVP Delta pumping operations, and all operation of the DPCR would be coordinated with CVP operators; and

- Wildlife Refuge water that could be provided to Level 4 wildlife refuges south of the Delta as a result of the proposed project would provide benefits to aquatic resources as the proposed project would increase the reliability of the water supply to these areas.

The assessment of impacts to fish resources was based on the CEQA significance thresholds described below, and professional judgment that considers current state, federal, and local regulations and policies, currently available peer-reviewed scientific literature, field survey observations, and knowledge of species' distribution, life history, and habitat requirements. Key considerations in the evaluation of impacts included the magnitude of environmental effects (e.g., spatial extent and duration of habitat modification), sensitivity of the species to these effects, and potential exposure or extent to which the population would be affected.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines,* as updated in December 2018, an impact on fish resources would be considered significant if the project 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 California Department of Fish and Game or U.S. Fish and Wildlife Service.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.
- 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.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Criteria Requiring No Further Evaluation

The potential for impacts related to riparian habitat and other sensitive natural communities, potential conflicts with local policies or ordinances protecting biological resources, and potential conflicts with provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan were previously addressed in *Section 3.4, Biological Resources-Terrestrial*. In addition, because project operations would be consistent with the Coordinated Operation Agreement and would not affect existing CVP Delta pumping operations, the impact analysis does not evaluate changes to reservoirs or conveyance facilities within the CVP system upstream of the proposed project site or exports downstream of the proposed project site.

Impacts and Mitigation Measures

Impact BIO-FISH-1 Substantial Adverse Effect on Candidate, Sensitive, or Special Status Species.

Construction Impacts

The project could result in temporary, localized construction-related impacts to fish resources, including special-status fish species. Construction activities that have the potential to adversely affect fish and aquatic habitat include:

- Excavation, grading, and vegetation removal
- Vehicle, equipment, and materials staging and storage
- Road relocation, including culvert and bridge construction
- Site preparation, including installation and operation of a piped bypass for creek diversion
- Main and saddle dam construction, including the main dam spillway, inlet/outlet works, foundation, and embankment
- Conveyance facilities construction, including pipeline, intake/outfall structure, and pumping plant construction
- Site restoration

Potential construction-related impacts on fish resources include direct harm to individuals; erosion, sedimentation, and turbidity via releases into Del Puerto Creek; exposure to hazardous materials and chemicals via releases into Del Puerto Creek; physical and visual disturbance; and habitat modification of Del Puerto Creek or lower San Joaquin River. The potential for these impacts to occur and the magnitude of their effects would depend on the proximity of construction disturbance areas to waterways, the extent, timing, and duration of construction activities, the specific construction methods used, and the specific measures implemented to minimize or avoid impacts.

Direct Harm

Construction activities that occur in or adjacent to stream channels where surface water is present could result in direct injury or mortality of fish. Potential mechanisms include fish being impinged or crushed by vehicles or equipment operating in the stream channel, and fish being stranded or entrained into pumps during dewatering of the stream channel. However, the potential for direct harm would be avoided or minimized by connecting Del Puerto Creek to the temporary stream diversion structures (e.g., bypass pipes) during the dry season (*Chapter 2, Description of the Proposed Project*, *Section 2.4.10, Environmental Commitments*), which would prevent exposure of fish to in-channel activities for the remainder of the construction period (*Section 2.4.10*). Therefore, the potential for direct harm to fish would be less than significant.

Erosion, Sedimentation, and Turbidity

Construction activities that disturb soil and sediments in stream channels, riparian zones, and adjacent upland areas can increase erosion and mobilization of sediments, potentially resulting in increased turbidity and suspended sediment in streams. Potential adverse effects on fish and aquatic habitat include physiological and behavioral effects on fish and reductions in habitat quality and prey resources (aquatic invertebrates) from increased turbidity and sedimentation. All construction activities that occur in or adjacent to stream channels (e.g., excavation, grading, and vegetation removal) have the potential to cause erosion and contribute sediment to Del Puerto Creek and its tributaries. However, with implementation of standard construction best management practices (BMPs) and other sediment and erosion BMPs that would be required as part of the Stormwater Pollution Prevention Plan (*Section 2.4.10*), potential impacts on fish and aquatic habitat would be minimized. Therefore, erosion, sedimentation, and turbidity resulting from construction activities would have a less-than-significant impact on fish and aquatic habitat.

Hazardous Materials and Chemicals

Hazardous materials and chemicals such as gasoline, engine oil, lubricants, or other fluids used during construction and maintenance activities could potentially enter stream channels as a result of seepage, leaks, or accidental spills. Accidental discharge of hazardous materials and chemicals could potentially harm fishes that may be present in the immediate vicinity or downstream of construction activities. However, with implementation of standard construction BMPs and other pollution prevention and control BMPs that would be required as part of the Stormwater Pollution Prevention Plan (*Section 2.4.10*), potential impacts on fish and aquatic habitat would be minimized. Therefore, the potential for impacts on fish from the accidental discharge of hazardous materials and chemicals would be less than significant.

Physical and Visual Disturbance

Construction noise, vibrations, artificial light, and other physical disturbances can harass fish, disrupt normal activities (e.g., feeding), cause fish to move into lower quality habitats, and increase exposure or vulnerability to predators. However, potential exposure of fish to such disturbances would be minimized by bypassing streamflow around construction areas. Therefore, potential impacts resulting from exposure of fish to construction disturbances would be less than significant.

Habitat Modification

Project construction would result in temporary modification of stream habitat from channel disturbance, vegetation removal, and dewatering. Channel disturbance, including installation and operation of stream diversions, would temporarily reduce the amount of stream area available to fish. Temporary impacts include approximately 481 linear feet of intermittent stream channel (Del Puerto Creek) within the construction limits of the proposed dam and spillway. Generally, such losses would result in impacts on physical habitat (living space), food production, cover, and flow continuity between upstream and downstream reaches. Similar to lower Del Puerto Creek, the habitat quality in the channel within the dam and spillway construction area is low because the channel is dry much of the year and generally lacks complexity (e.g., pools) or cover. These losses would not substantially affect the overall quantity and quality of habitat available to native fish because of the small proportion of channel area affected, the low quality of habitat within the construction areas, and the maintenance of streamflow to downstream reaches via the inlet/outlet tunnel. Therefore, potential impacts resulting from temporary modification of aquatic habitat would be less than significant.

Operation Impacts

Project operations could result in long-term or permanent impacts to fish resources in Del Puerto Creek. Potential operational impacts include permanent losses of aquatic habitat within the footprints of the project facilities, permanent modification of aquatic habitat within the reservoir inundation area, and potential flow-related effects on aquatic habitat in lower Del Puerto Creek and San Joaquin River.

Habitat Loss or Modification: Inundation Area

The main dam, spillway, and inlet/outlet structure would result in the permanent loss of approximately 1,816 linear feet of intermittent stream channel (Del Puerto Creek). The proposed roadway would result in the permanent loss of approximately 60 linear feet of intermittent stream channel (Del Puerto Creek) and 548 linear feet of ephemeral channels that connect to Del Puerto Creek. These losses would not substantially affect the overall quantity and quality of habitat available to special-status fish species because of the small proportion of channel area affected and the low quality of habitat within these areas. Habitat quality within these areas is low because the channels are dry much of the year and generally lack physical complexity (e.g., pools) or instream and overhead cover. In addition, because native fish populations are maintained largely by watershed and stream conditions above the dam site, the loss of channel area within the footprint of the main dam and associated facilities is unlikely to adversely affect native fish species. No adverse effects are expected to occur within the tributary channels because of the ephemeral nature of these drainages and thus the inability to support fish populations.

Filling and operation of the reservoir would result in permanent modification of aquatic habitat by replacing intermittent and ephemeral stream habitat above the dam with a permanent body of water subject to fluctuations in volume, depth, and surface area. Filling of the reservoir would result in the permanent loss of approximately 4 miles of Del Puerto Creek and 3.4 miles of ephemeral tributaries. These impacts include the loss of isolated stream segments and pools in Del Puerto Creek that potentially support native fish through the summer based on the presence of juvenile suckers and pikeminnows in July 2019. The response of native minnow and sucker populations to reservoir creation cannot be accurately predicted but general predictions can be made based on observations from other California reservoirs and general species requirements. Reservoirs can provide suitable habitat for native and introduced fish species but are generally less productive than natural lakes because of their depth, steep slopes, and fluctuating water levels that typically limit spawning and rearing success (Moyle 2002, p. 36). Native suckers and minnows are reported to use reservoirs and, in some cases, have developed large populations where introduced predators or competitors are absent (Moyle 2002, p. 37). Although fish stocking is not planned and would not be allowed (*Chapter 2, Section 2.3.3, Potential Future Uses*), the potential exists for future introductions of these species to occur through the transfer of water or accidental or deliberate introductions. Considering the physical and operational characteristics of the reservoir and the potential presence of introduced fish species, the reservoir is not likely to provide suitable habitat for native fish species. Although existing stream habitat within the upper reservoir inundation area would be lost, native fish populations would be expected to continue to persist in Del Puerto Creek above the inundation area. Therefore, the loss of habitat for native fish species is considered a less-than-significant impact (see Impact BIO-FISH-2).

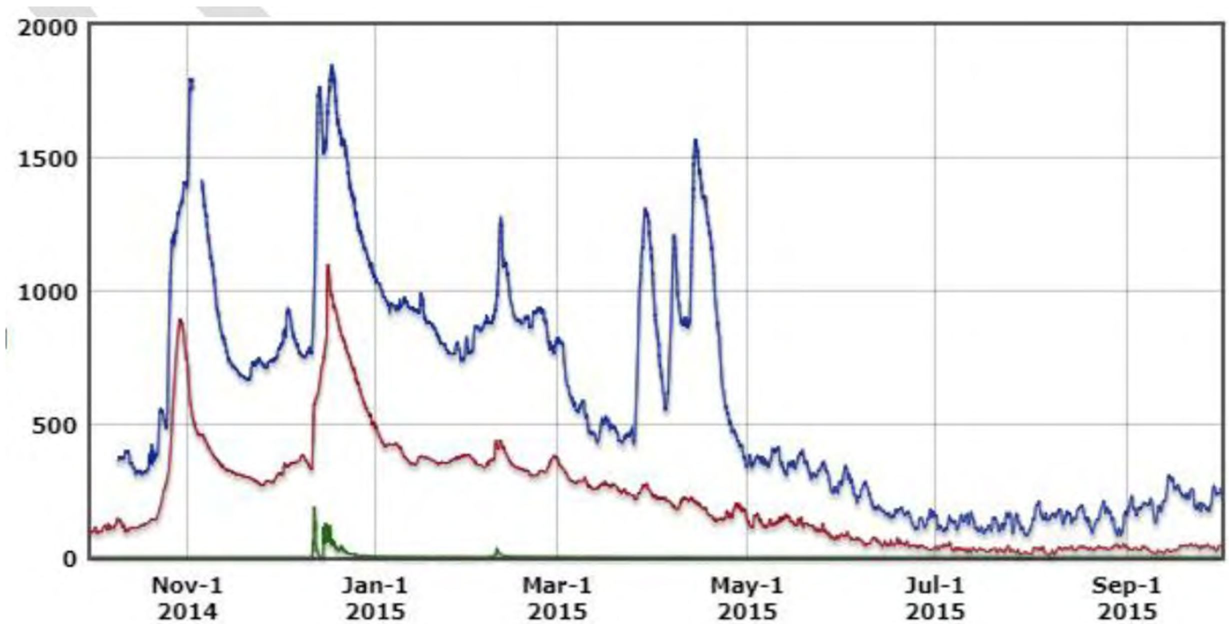
Habitat Loss or Modification: Downstream Effects

Proposed dam and reservoir operations could also adversely affect downstream fish resources by altering the amount and timing of flows to the San Joaquin River. Flow alteration resulting from dam and reservoir operation is recognized as a major factor in the decline and current status of native anadromous and estuarine fishes in the Central Valley. For example, the loss of access to historical spawning and rearing habitat above dams and subsequent impacts of dams and reservoir operations on habitat below the dams are cited as key reasons for the listing of winter-run Chinook salmon, spring-run Chinook salmon, and steelhead (Yoshiyama et al. 1998, NMFS 2014). While cold water storage and releases below these dams have allowed some populations to persist, the alteration of seasonal flow and temperature patterns and disruption of natural hydrologic and geomorphic processes have caused significant habitat degradation in downstream reaches.

Although unregulated, Del Puerto Creek accounts for a very small fraction of the total seasonal flows in the lower San Joaquin River. For example, in developing updated flow objectives for the Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary, the State Water Board did not include Del Puerto Creek and other westside tributaries because they do not support salmon populations and supply less than 1 percent of the available average unimpaired flow to the watershed (State Water Resources Control Board 2018). CalSIM modeling of existing conditions (based on 1921 to 2003 historic hydrology) shows that average annual San Joaquin River flow is 3,137 TAF, while average annual Del Puerto Creek flow into the San Joaquin River is 2.7 TAF (0.0861 percent of San Joaquin River flow). Under project conditions, average annual Del Puerto Creek flows in the San Joaquin River would decrease to about 0.3 TAF (see **Table 3.11-6** in *Section 3.11, Hydrology and Water Quality*). The small flow contributions of Del Puerto Creek to the San Joaquin River can also be illustrated by comparing the measured daily flows in Del Puerto Creek, the San Joaquin River near Crows Landing, and the San Joaquin River near Vernalis in water years 2015 through 2019 (**Figure 3.5-4**, **Figure 3.5-5**,

Figure 3.5-6, **Figure 3.5-7**, and **Figure 3.5-8)[1].** During these years, annual minimum, mean, and maximum daily flows in Del Puerto Creek averaged 0%, 0.4%, and 3.0%, respectively, of the San Joaquin River flow near Crows Landing, and 0%, 0.2%, and 1.7%, respectively, of the San Joaquin River flow near Vernalis.

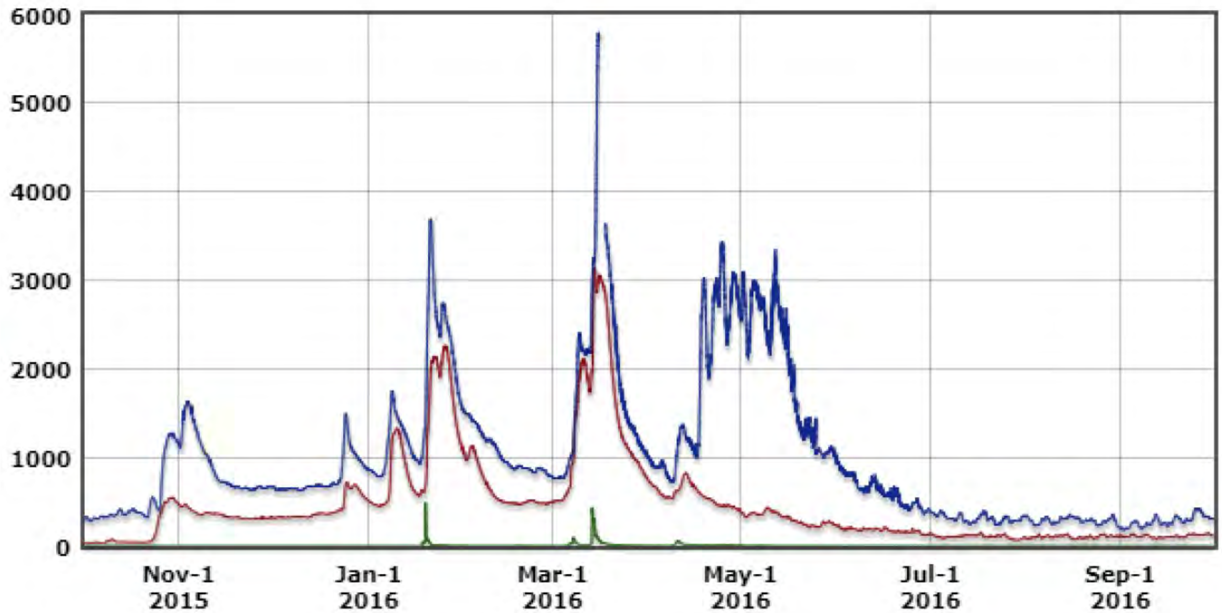
Figure 3.5-4: Water Year 2015 Daily Flow (cfs) Measured in Del Puerto Creek, San Joaquin River near Vernalis and Crows Landing



Note: green line at the very bottom of the figure depicts Del Puerto Creek flows
blue line on the top depicts flows in San Joaquin River near Vernalis
red line in the middle of the figure shows depicts flows at Crows Landing

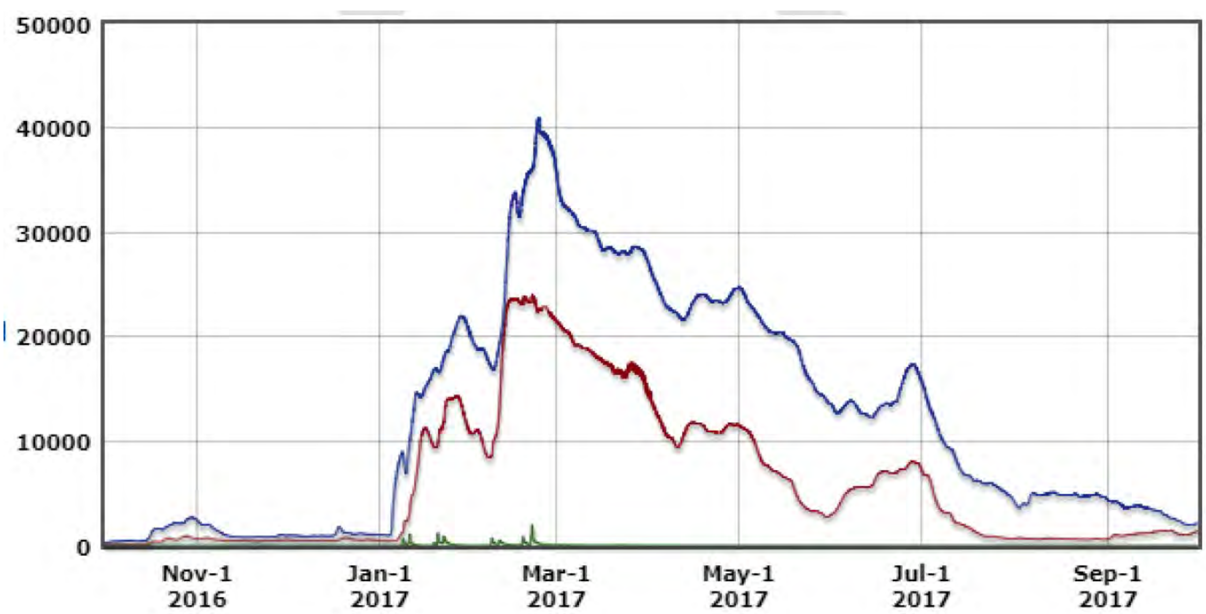
[1] These figures were generated by USGS's National Water Information System Web Interface (https://waterdata.usgs.gov/nwis/rt); note that the Y-axis flow range varies depending on the magnitude of flows in individual water years.

Figure 3.5-5: Water Year 2016 Daily Flow (cfs) Measured In Del Puerto Creek, San Joaquin River near Vernalis and Crows Landing



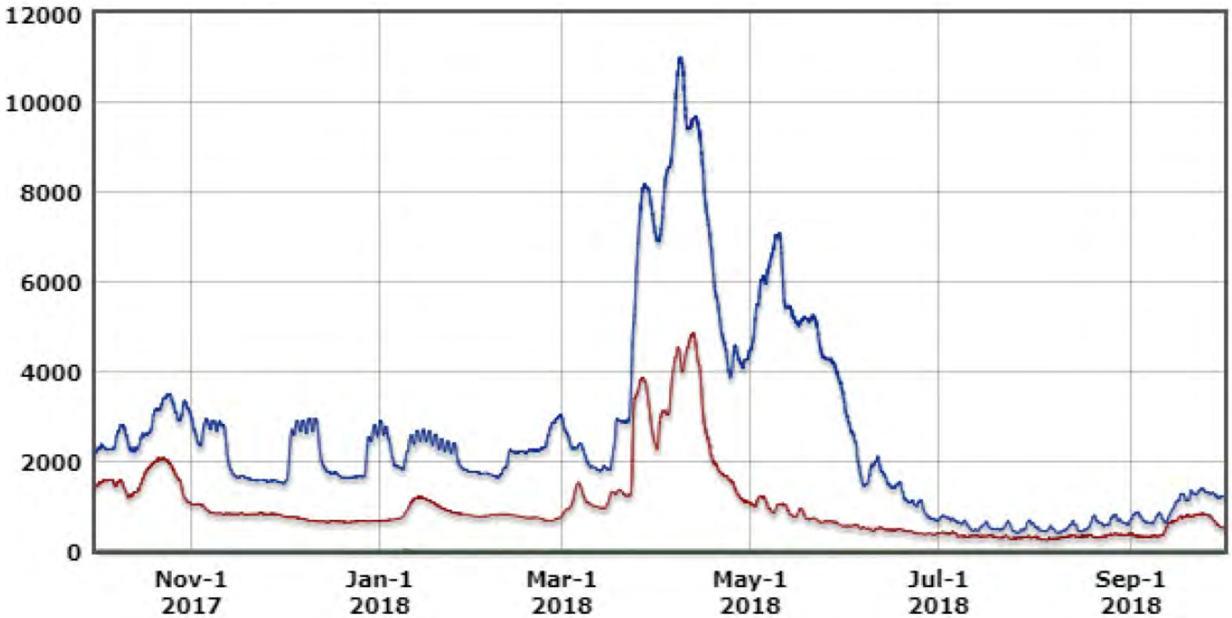
Note: green line at the very bottom of the figure depicts Del Puerto Creek flows
blue line on the top depicts flows in San Joaquin River near Vernalis
red line in the middle of the figure shows depicts flows at Crows Landing

Figure 3.5-6: Water Year 2017 Daily Flow (cfs) Measured In Del Puerto Creek, San Joaquin River near Vernalis and Crows Landing



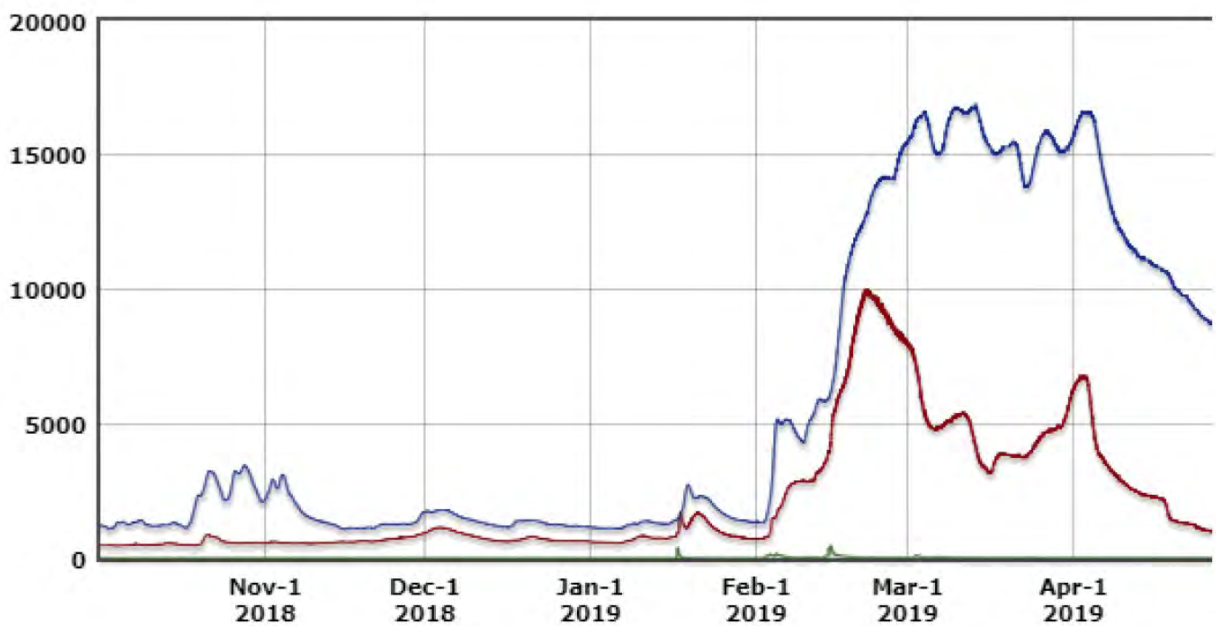
Note: green line at the very bottom of the figure depicts Del Puerto Creek flows
blue line on the top depicts flows in San Joaquin River near Vernalis
red line in the middle of the figure shows depicts flows at Crows Landing

Figure 3.5-7: Water Year 2018 Daily Flow (cfs) Measured In Del Puerto Creek, San Joaquin River near Vernalis and Crows Landing



Note: green line at the very bottom of the figure depicts Del Puerto Creek flows
blue line on the top depicts flows in San Joaquin River near Vernalis
red line in the middle of the figure shows depicts flows at Crows Landing

Figure 3.5-8: Water Year 2019 Daily Flow (cfs) Measured In Del Puerto Creek, San Joaquin River near Vernalis and Crows Landing



Note: green line at the very bottom of the figure depicts Del Puerto Creek flows
blue line on the top depicts flows in San Joaquin River near Vernalis
red line in the middle of the figure shows depicts flows at Crows Landing

Under proposed project operations, major flow events in Del Puerto Creek would continue to be released downstream of the proposed dam as part of the environmental commitments of the project. These environmental flow requirements include operation of the dam to bypass major flow events in a pattern that preserves key components of the peak flow events (*Section 2.3.1, Reservoir Operations*). This is consistent with the "functional flow" approach of managing flows in regulated rivers to mimic the natural patterns of flow variability that drive the geomorphic and ecological processes supporting native aquatic species (Yarnell et al. 2015). For example, large-magnitude flows during the annual flood season typically transport a significant portion of the annual sediment load in unregulated streams. In Del Puerto Creek, these flows are likely the principle mechanism for delivery of coarse sediment (gravel) to the San Joaquin River where evidence suggests that it serves an important role in maintaining white sturgeon spawning habitat (Marineau et al. 2017) (see *Section 3.5.1, Environmental Setting*).

As described in *Section 3.11, Hydrology and Water Quality*, modeling of the proposed environmental releases described in *Section 2.3.1* of the *Project Description* was based on a set of general operations rules designed to maintain periodic peak flow events associated with sediment mobilization in lower Del Puerto Creek. Estimates of the sediment transport capacity of Del Puerto Creek at the proposed dam site and near the confluence with the San Joaquin River indicate that flows of 500 cfs[2] or more can mobilize significant quantities of gravel-size bed material within the range of sizes observed in Del Puerto Creek and the San Joaquin River (2- to 64-mm diameter) (Woodard & Curran 2019). Under the proposed rules, the reservoir would be operated to release peak daily flows of 500 cfs or more (reservoir inflows from Del Puerto Creek) and then reduce flows over a period of up to six days at a rate reflecting the natural recession rate. These proposed rules are intended to preserve the flow events that transport gravel to the San Joaquin River and maintain Del Puerto Creek's contribution to potential white sturgeon spawning habitat in the San Joaquin River. Other important functions of these flows in Del Puerto Creek may include reducing sediment accumulations of pesticides and other contaminants, maintaining flow and sediment dynamics supporting native aquatic and riparian species, and eliminating introduced species that are not adapted to the natural flow regime (Kiernan et al. 2012). Although Del Puerto Creek accounts for only a very small fraction of the flows in the San Joaquin River, the preservation of these flows would continue to support the flow management goals and objectives of ongoing species recovery and habitat restoration programs in the San Joaquin River (e.g., San Joaquin River Restoration Program).

Artificial reservoirs can also alter water temperature, dissolved oxygen, and other physical and chemical properties of water released into receiving streams, as well as reduce or eliminate the natural transport of sediment and organic material to these reaches (Spence et al. 1996). In general, reservoirs increase water surface area and heating of surface waters that, depending on the withdrawal depth, can result in increased temperatures in downstream reaches. Most of the water released to lower Del Puerto Creek to meet environmental flow requirements would be released concurrently with major winter and spring flow events when reservoir storage is high (or increasing) and air and inflow water temperatures are at annual minimums. These conditions would be expected to minimize the potential for adverse effects of reservoir operations on water temperatures in lower Del Puerto Creek and on dissolved oxygen levels, which generally decrease with increasing water temperature.

The proposed dam and reservoir would retain coarse-grained sediment entering the reservoir from the upper reaches of the Del Puerto Creek watershed, potentially reducing the supply of gravel to the lower San Joaquin River where it likely serves an important role in maintaining potential spawning habitat for white sturgeon (Marineau et al. 2017). Little is currently known about the sediment transport processes in Del Puerto Creek, or the extent to which the gravel found in the Lower San Joaquin River comes from upper Del Puerto Creek above the proposed dam site or lower Del Puerto Creek below the proposed dam site. Thus, the presence of the dam and reservoir could eliminate this source of spawning gravel if the

[2] Based on historical daily flows measured at the Del Puerto Creek gauging station (USGS 11274630), there were 12 peak flow events of 500 cfs or more during the 55-year historical flow record.

majority of the spawning gravel being deposited from Del Puerto Creek into the lower San Joaquin River is originating from above the proposed dam site. This is considered a potentially significant impact.

Significance before Mitigation

All construction-related activities would result in impacts that are less than significant because BMPs that would be implemented as part of the project would avoid adverse effects to Del Puerto Creek that could affect fish. The permanent loss of habitat due to inundation of Del Puerto Creek would also be a less-than-significant impact because of the limited quantity and quality of existing habitat for native fish in the inundation area and the presence of suitable habitat in upper Del Puerto Creek. Peak flows below the proposed dam would not be substantially altered because of the environmental commitment to preserve peak flow events to support the habitat needs of native fish species. However, the proposed dam and reservoir could have a long-term impact on the supply of coarse-grained sediment to the San Joaquin River, resulting in a potentially significant impact on white sturgeon spawning habitat.

Mitigation Measures

Mitigation Measure BIO-FISH-1: Spawning Gravel Monitoring and Mitigation

A spawning gravel mitigation and monitoring plan shall be developed and implemented by the Project Partners to address potential impacts on white sturgeon spawning habitat in the San Joaquin River. The goal of the plan will be to ensure no long-term deficits in the supply of gravel from Del Puerto Creek to the San Joaquin River. The plan shall include pre- and post-project measurements of bedload transport rates, channel morphology, and bed composition in lower Del Puerto Creek, and an implementation plan for augmenting gravel in this reach if monitoring detects a significant reduction in gravel loads to the San Joaquin River.

The purpose of pre-project monitoring would be to define baseline bedload transport rates and channel and bed characteristics prior to dam construction and operation. These measurements would serve as a reference point for evaluating changes in the sediment budget of lower Del Puerto Creek following dam construction. Existing modeling results of the sediment transport capacity of Del Puerto Creek near the proposed dam site and near its confluence with the San Joaquin River would be used to establish initial estimates of gravel transport loads associated with the proposed environmental flow releases (≥ 500 cfs) (Woodard & Curran 2019). These estimates would be used in combination with pre- and post-project measurements of sediment transport and channel and bed characteristics to evaluate changes in the supply of gravel to the San Joaquin River.

A professional geomorphologist shall develop a detailed geomorphic monitoring and assessment plan that will be included as part of the mitigation and monitoring plan. Key components of the plan will include a statement of the goals and objectives, pre-project surveys to establish sediment transport and channel monitoring stations, and a detailed description of the sampling design and pre- and post-project monitoring and assessment methods. The number and location of monitoring stations shall be sufficient to characterize pre- and post-project trends in gravel inputs, storage, and outputs in lower Del Puerto Creek as well as associated changes in channel form (e.g., cross sections) and size composition of the bed material.

The need for post-project gravel augmentation will be based on the detection of significant changes in sediment (gravel) transport loads, channel form, and bed composition in lower Del Puerto Creek. Because the proposed environmental flow releases are expected to maintain the sediment transport capacity of the creek, any major deficits in the supply of gravel to the channel downstream of the dam would be expected to result in reductions in gravel transport loads and potential changes in channel and bed characteristics such as bed incision, bank widening, and bed coarsening. The following criteria are proposed as thresholds to determine substantial sediment deficits and the need for gravel augmentation:

- Post-project measurements of gravel transport loads during peak flow releases indicate that loads have been substantially reduced (>10%) relative to pre-project levels.
- A comparison of pre- and post-project channel characteristics (bed elevations, channel widths, and slopes) indicates a substantial change (>10%) in channel morphology associated with a sediment deficit.
- A comparison of pre- and post-project bed composition measurements indicates a substantial reduction (>10%) in the amount of gravel (2- to 64-mm diameter) available for transport in the active channel of lower Del Puerto Creek.

Because the frequency of monitoring will be dictated by the frequency of major flow events and environmental releases, sediment and channel monitoring will be conducted over a sufficient period to encompass at least three major flow events (≥ 500 cfs) during the post-project monitoring period. Repeated measurements of sediment and channel characteristics over a number of years are necessary to detect major shifts in the sediment regime amid the variability in scour and fill dynamics that may occur over shorter time frames. Although it would be ideal to monitor an equal number of pre-project events, this will likely not be possible because of the limited time frame before project implementation. In this case, the modeled or estimated sediment transport capacity of the creek and the characterization of pre-project channel and bed characteristics will serve as the primary reference conditions for the post-project evaluation.

The spawning gravel mitigation and monitoring plan shall also include a description of the spawning gravel augmentation program that would be implemented if monitoring detects a significant reduction in the supply of gravel to the San Joaquin River. The plan will include a list of potential gravel sources (borrow or spoil sites[3]), a description of the methods for determining the locations of gravel placement sites, a description of the monitoring methods that will be used to ensure the effectiveness of mitigation, and a description of the implementation schedule, agency coordination requirements, funding commitments, reporting, and regulatory/permitting requirements of the program.

Significance after Mitigation

Implementation of Mitigation Measure BIO-FISH-1would reduce potentially significant impacts on white sturgeon spawning habitat to less-than-significant levels by augmenting gravel supplies as necessary to maintain existing contributions of gravels to the San Joaquin River.

Impact BIO-FISH-2 Interference with the Movement of Native Resident or Migratory Fish or Wildlife Species or Established Native Resident or Migratory Wildlife Corridors, or Use of Native Wildlife Nursery Sites.

Construction Impacts

Channel dewatering and diversion of Del Puerto Creek around the dam construction site would preclude movements of fish during the construction period. Based on the presence of existing fish passage impediments, poor quality of existing habitat, and likely low utilization of lower Del Puerto Creek by native fish, this does not pose a substantial threat to native fish populations which are maintained largely by watershed and stream conditions above the dam site. The proposed saddle dams would not pose barriers to fish movement because of the ephemeral nature and lack of suitable habitat in the affected stream channels.

[3] Existing sites include the spoil site that is currently used for ongoing channel maintenance activities in Del Puerto Creek (California Department of Water Resources 2015).

Operation Impacts

Once completed, the proposed dam on Del Puerto Creek would create a permanent barrier to fish migration but would not likely have a substantial effect on native fish populations for the reasons stated above for construction impacts.

During reservoir operations, sediment will likely be deposited in the upper reaches of the reservoir, potentially creating a migration barrier to fish. Reservoirs cause reductions in stream energy where streams enter the upper reaches of reservoirs, resulting in sedimentation of the existing channel. During sediment transport events, sediment that enters the low-velocity inflow areas of reservoirs generally settles to form a delta with heavier coarse material depositing in the upstream portion of the delta and finer materials depositing downstream as a function of current velocity. Where large fluctuations in reservoir levels occur, these deltas can be exposed during low reservoir levels, creating a barrier to fish migration (Vernieu 1997) (see *Section 3.11, Hydrology and Water Quality*, for more information regarding reservoir elevation fluctuations). As previously discussed (see Impact BIO-FISH-1, Habitat Loss or Modification: Inundation Area), the proposed reservoir would not likely provide suitable habitat for native fish species. In addition, because of the presence of suitable habitat for maintaining existing native fish populations above the reservoir inundation area, the lack of fish passage between the reservoir and upper Del Puerto Creek would not be critical for maintaining these populations. Therefore, this is considered a less-than-significant impact.

Significance before Mitigation

Construction-related impacts on fish passage would be less than significant because of the poor quality of existing habitat and likely low utilization of lower Del Puerto Creek by native fish. During reservoir operations, large fluctuations in reservoir levels and sedimentation of Del Puerto Creek would potentially result in a barrier to fish migration between the reservoir and upper reaches of the creek. However, this is considered a less-than-significant impact to native fish populations because of the lack of suitable habitat in the reservoir and the ability of these population to persist in the remaining habitat above the reservoir.

Mitigation Measures

No mitigation is required for construction and operation impacts on fish passage.

Cumulative Impact Analysis

The geographic scope of the cumulative impacts on fish resources encompasses the study area and surrounding areas. If the proposed project, as well as other projects listed in **Table 3.0-1**, would adversely affect the same fish resources, they could result in significant cumulative impacts on fish resources of the area. Construction and operation of the proposed project would result in less-than significant impacts on fish resources with the implementation of the environmental commitments and proposed mitigation measures described above.

Project operations would contribute to reductions in existing flows downstream of the proposed dam; however, the flows necessary to maintain existing habitat conditions in Del Puerto Creek and the San Joaquin River would continue to be released as part of the project's environmental commitments. Because these flows are intended to maintain habitat for fish (and thus do not constitute an impact to fish resources), there would be no incremental contribution to cumulatively considerable impacts to fish resources. The City of Patterson is proposing a water supply project to capture and divert uncontrolled stormwater flows from Del Puerto Creek to infiltration ponds for groundwater recharge (RMC 2018). As mitigation for potential project impacts to the City's proposed future water supply project, the Project Partners are developing an agreement with the City to provide water to allow implementation of their recharge project (see **Mitigation Measure HYD-2**). Any water supplied to the City of Patterson as mitigation for project impacts on their future water supply project would be in addition to water released as part of the project's environmental commitment. The City's recharge project would thus not combine with the proposed project to result in a cumulatively considerable contribution to reductions in flows, and cumulative impacts would be less than significant.

Significance Determination

The proposed project would not result in significant reservoir-inundation impacts on fish resources. Because the Project Partners would provide water to the City of Patterson separate from proposed environmental releases there would be no cumulatively significant flow impacts on fish habitat in Del Puerto Creek.

Mitigation Measures

See the following mitigation measure as well as the environmental flows described in Chapter 2.

- Mitigation Measure BIO-FISH-1: Spawning Gravel Monitoring and Mitigation

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3.6 Cultural Resources

This section evaluates the potential impacts on cultural resources associated with implementation of the proposed project. Cultural resources are defined as prehistoric and historic period archaeological sites or isolated finds; buildings, structures, and objects within the historic period-built environment; and resources of traditional importance to Native American tribes and other cultural groups. They are typically identified through surface survey, subsurface testing, documentary evidence, consultation with Native American groups and/or oral history. For the purpose of this analysis, the study area includes cultural resources in the vicinity of the facilities to be constructed or modified under the proposed project.

3.6.1 Environmental Setting

The discussion below defines the terms used in the cultural resources evaluation and describes the cultural resource conditions specific to the study area based on records searched, communications with identified Tribes, stakeholders and other interested parties, and pedestrian surveys conducted in the spring and summer of 2019.

For information regarding the larger regional prehistoric and historic context of the Central Valley, Sacramento Area, and study area please refer to Appendix C, *Regional Prehistoric and Historic Context*. This appendix specifically discusses the following information:

- **Regional prehistory:** identifying the archeological record of different time periods chronologically as well as discussion of contemporaneous cultural patterns
  - **Terminal Pleistocene and Early Holocene (13,500–7000 BP):** archaeological remains represented by core tools and large reworked flakes - identified as the Farmington Complex
  - **Middle to Late Holocene (7000–1200 BP):** increased populations moving into the Central Valley, specialized tools and diversified diet – identified as the Windmiller and Berkeley Patterns
  - **Late Horizon (1200 BP to Historic Period):** continued increase in valley populations, elaboration of ceremonial and social organization, including the development of social stratification – identified as the Augustine Pattern
  - **Ethnography:** discussion of the people that lived within the larger region and the study area including the Northern Valley Yokuts.
- **Historic Setting:** identifying the historic record of different geographies and activities
  - **City of Patterson:** settlement and inhabitants of the city
  - **Del Puerto Canyon:** resource extraction, railroad, and construction of the Del Puerto Canyon Road
  - **Irrigation**: development of water supply infrastructure to support irrigation and the influence of irrigation and infrastructure on the Central Valley and the study area
  - **Electrical Transmission:** development of electrical transmission infrastructure to support Central Valley development

Methods for Assessing Existing Cultural Resources in Region and Study Area

Background research and field studies were conducted in compliance with CEQA as amended (Pub. Resources Code § 21000 et seq.), pursuant to the Guidelines for Implementation of CEQA (Cal. Code Regs. Title 14 §15000 et seq.). The effort to identify cultural resources in the study area included records searches of previous cultural resource investigations and recorded sites; background research and a review of literature relevant to the prehistory, ethnography, and history of the project vicinity; consultation with the Native American Heritage Commission (NAHC), Native Americans, historical societies, site visits and pedestrian surveys of the study area, which are described below. For the purposes of evaluating the possible presence of resources that could be affected by the proposed project an Area of Potential Effect (APE) was defined, which encompasses the area that could be disturbed by construction of project facilities.

Records Search

On April 9, 2019, staff at the California Historical Resources Information System's (CHRIS) Central California Information Center (CCIC) conducted a records search and literature review for the APE and a 0.25-mile buffer surrounding the APE, which is defined as the study area. The records search and literature review by the CCIC provides documentation for previously documented archaeological, historic, and architectural resources within and near the study area, and is useful for developing a context to frame assessments of resource significance. The records search results indicate that 20 previous cultural resource studies have been conducted within the study area. Of those 20, 17 studies included a portion of the APE. Most of the study area was previously studied in 1993 as part of the Del Puerto Alternative Reservoir Site project (Bell et al. 1993). During this study, approximately 640 acres of the current project was subject to an archaeological pedestrian survey. Because this survey was conducted over ten years ago and is not considered current, an updated survey was warranted for the current investigation.

The records search also indicated that 15 cultural resources have been recorded within the APE and one resource located within the 0.25-mile buffer. The previously recorded resources within the APE consist of prehistoric bedrock milling station and habitation sites, historical ranching sites, railroad segments, canals, and aqueducts.

Surveys

Archaeological pedestrian surveys of the APE were conducted by ICF staff on May 6 through 10, 13 and 14; June 24 and 25; July 12, 16, 17, and 25, 2019. The field survey methods consisted of systematic intensive pedestrian survey conducted by walking in 15-meter transects across the APE. Any areas of the APE that were not intensively surveyed were either not accessible due to safety concerns or were located on steep (over 30 percent) slopes which are generally considered unsuitable for habitation and, accordingly, have a low potential for containing prehistoric resources. Overall, ground visibility was poor, with an average of 20 percent visibility across almost the entirety of the APE. The poor surface visibility was due mostly to dense grasses and weeds covering the hills and valleys, and dense riparian vegetation along Del Puerto Creek. Surface visibility was very good along northern portions of Del Puerto Creek that were surveyed in July as a result of a fire that occurred through the area in June 2019. A total of ten archaeological sites are located in the APE.

Following the archaeological pedestrian surveys, subsurface testing was conducted by ICF in September and October 2019 at five archaeological sites[1] within the APE in order to identify the presence of buried archaeological material and to evaluate the sites under Criterion D (NRHP) and Criterion 4 (CRHR). Built environment surveys were conducted on May 23, 2019 by ICF architectural historian staff. During these surveys, all built environment resources within the APE were visited and their condition documented.

Native American Consultation

On June 5, 2019, ICF contacted the NAHC requesting a review of its Sacred Lands Files. On July 17, a letter was received from the NAHC, which stated that no Sacred Sites had been identified in the study area and provided contact information for three tribes. On July 19, 2019 outreach letters were sent to the three following contacts provided by the NAHC:

- Katherine Erolinda Perez, Chairperson, North Valley Yokuts Tribe
- William Leonard, Chairperson, Southern Sierra Miwuk Nation

[1] Testing was performed at six locations but one site contained no cultural material.

- Neil Peyron, Chairperson, Tule River Indian Tribe

The letters were intended to gather information regarding prehistoric archaeological sites and features, Sacred lands or locations that are important in Native American culture, places that the Native American community continues to use for ongoing cultural practices and activities, or historic-era resources such as structures, residences, or other built-environment features. Follow up phone calls to the three contacts were conducted on August 15, 2019. Only one response was received from the letters and phone calls. William Leonard stated that the project is out of the Southern Sierra Miwuk Nation's tribal territory and he would defer to the Tuolumne or Chicken Ranch tribes. Shana Powers, the Cultural Department Director of the Tachi-Yokut Tribe of the Santa Rosa Rancheria, and Katherine Perez of the Northern Valley Yokut Tribe, contacted the Del Puerto Water District on November 11 and 12, 2019 respectively. Both expressed interest in learning more about the proposed project. A field visit was conducted on December 11, 2019 with representatives of the Santa Rosa Rancheria (Tachi Yokuts) and Nototomne Cultural Preservation (North Valley Yokuts). The Project Partners are currently in communications with these two Tribes.

Other Interested Parties Consultation

On April 12, 2019, ICF sent contact letters to the Patterson Township Historical Society, the Great Valley Museum of Natural History, and the McHenry Museum. The letters briefly described the proposed project and requested information about cultural resources near the study area. As of September 10, 2019, ICF has not received any responses to the contact letters.

Study Area

The study area includes the APE, which is primarily comprised of the inundation area within Del Puerto Canyon and the areas of potential temporary and permanent disturbance adjacent to the Delta-Mendota Canal (DMC), plus a buffer area. Several eligible historic-period built environment resources have been documented and ~~several assumed~~ 11 prehistoric archaeological resources have been documented based on the methods used above. These resources are described below.

Summary of Historic Period-Built Environment Resources

Historical resources is a term defined under CEQA and the Public Resources Code (PRC) (see *Section 3.6.2, Regulatory Framework, CEQA, Cultural Resources*, for the full definition of historical resource as identified by PCR Section 21084.1 and CEQA Guidelines Section 15064.5(a) and (b)). A total of three CEQA historical resources are located in the APE. Two CEQA historical resources are related to the development of irrigation: the DMC and the California Aqueduct (Aqueduct). The Project Partners currently obtain water supply for irrigation purposes from the DMC. The other CEQA historical resource, which is related to the development of electrical transmission, the Tesla-Los Banos #1 and Tracy-Los Banos 500 kV Transmission Lines (Pacific Intertie), is located in the APE. A description of these CEQA historical resources is provided below.

Delta-Mendota Canal

The DMC is a historical resource for the purpose of CEQA. The segment of canal in the study area is an 0.4-mile stretch of concrete lined canal, approximately 100 feet across, with a likely bottom width of 48 feet, 1 to 1.5-foot slide slopes, and a water depth of 16 feet. The canal is flanked by one paved road with both gravel and dirt on the eastern side and a dirt and gravel road on the western side. The segment includes the Del Puerto Siphon, which takes the canal underground to allow the seasonal flows in Del Puerto Creek, to cross over the canal. The siphon consists of multiple rectangular barrels and occurs 0.2 miles within the APE segment of the canal. The setting is rural, consisting of orchards to the east and west; the Aqueduct and I-5 are located to the west.

Completed in 1951, the DMC supplies irrigation for approximately 1,000,000 acres of agricultural lands in the San Joaquin Valley, as well as municipal and industrial, and refuge water supplies. The DMC is part of the CVP, which provides water from the wetter Sacramento Valley to the drier San Joaquin Valley, one of the main centers of California's agricultural economy.

The DMC was previously evaluated and is eligible for the NRHP and CRHR under Criterion A/1 for its role as part of the CVP and C/3 for its significance in engineering related to design and construction. SHPO concurred with this evaluation on June 16, 2010 (Reference BUR100614A) (Office of Historic Preservation 2010). ~~Therefore, the DMC appears eligible for listing in the NRHP and the CRHR.~~ The structure was evaluated for the purposes of the proposed project in accordance with Section 15064.5 (a)(2)-(3) of CEQA Guidelines and using the criteria outlined in Section 5024.1 of the PRC and is a historical resource for the purposes of CEQA.

California Aqueduct

The Aqueduct is a historical resource for the purposes of CEQA. The segment of the main branch of the Aqueduct located within the study area is an approximately 0.3-mile stretch of trapezoidal concrete lined canal, approximately 126 feet across, with a depth of about 30 feet at the location of proposed pipeline crossing. The canal is flanked by access roads. Approximately 179 feet from the northwestern end of the segment within the APE there is a concrete bridge that provides vehicular access to a dirt road. There is a subterranean passthrough for Del Puerto Creek approximately 0.2 miles within the segment in the APE. The setting is rural, consisting of abandoned orchards to the east and I-5 located to the west, with Del Puerto Canyon beyond I-5.

Built between 1960 and 1974, the Aqueduct is the largest and most significant component of the water conveyance systems developed as part of the State Water Project. The aqueduct delivers water to both municipal users throughout the state of California and to agricultural users in the San Joaquin Valley, and irrigation allowed thousands of acres of new agricultural land to be developed.

The Aqueduct was previously evaluated and is eligible for the NRHP and CRHR under Criterion A/1 for its role as part of the State Water Project and C/3 for its significance in engineering related to design and construction. SHPO concurred with this evaluation on June 28, 2011 (Reference FHWA120615A) (Office of Historic Preservation 2012). Therefore, the Aqueduct appears eligible for listing in the NRHP and the CRHR. The structure was for the purposes of the proposed project evaluated in accordance with Section 15064.5 (a)(2)-(3) of CEQA Guidelines and using the criteria outlined in Section 5024.1 of the PRC and is a historical resource for the purposes of CEQA.

Tesla-Los Banos #1 and Tracy-Los Banos 500 kV Transmission Lines/Pacific Intertie

Within the study area, the PG&E Tesla-Los Banos #1 and Tracy-Los Banos 500 kV transmission lines were constructed in 1967 and 1968 and run parallel to three other PG&E power and transmission lines at the base of Del Puerto Canyon, to the west of I-5. Tracy-Los Banos was originally called Tesla-Los Banos #2, but was re-routed between 1987 and 1993, when the northern end of the line was redirected through the Tracy Substation. This line was the first of the two lines present to be electrified by PG&E in 1967. Another transmission line, the Moss Landing-Metcalf 500 kV line, is not in the study area but is part of the Pacific Intertie built by PG&E in the same time period, 1965-1968 (JRP 2019).

The Tesla-Los Banos #1 and Tracy Los Banos 500 kV Transmission Lines/Pacific Intertie is a historical resource for the purpose of CEQA. This segment of the Tesla-Los Banos #1 (1968) and Tracy-Los Banos (1967) 500 kV extra high voltage (EHV) Transmission Lines compose two parts of the Pacific Intertie. The segment runs for approximately 7 miles within the APE, running northwest to southeast at the base of Del Puerto Canyon, to the west of I-5. The Tesla-Los Banos #1 line runs west of the Tracy-Los Banos line. Each parallel EHV circuit is comprised of three sets of double-bundled cables, with each pair of bundled conductors bound by numerous, regularly spaced, metal, closed spring-type spacers. In this segment, each circuit is carried by lattice-steel, single-circuit, H-frame suspension transmission towers. The towers are approximately 140 feet tall, with a base width of approximately 55 feet.

Several segments of the Pacific Intertie were recorded by JRP in 2018 (JRP 2019). The segments of the Tesla-Los Banos #1 and Tracy-Los Banos 500 kV transmission lines recorded as part of this effort are about 30 miles from the project APE. The evaluation found the recorded segments of the Tesla-Los Banos #1 and Tracy-Los Banos transmission lines eligible for the NRHP and CRHR under Criterion A/1 as the first transregional EHV transmission grid in the country integrating federal, municipal, and investor-owned transmission networks and under Criterion C/3 for its comprehensive design and development of EHV alternating current and high-voltage direct current transmission technologies. The period of significance is 1967-1970, the years of construction of the Pacific Intertie. The only alteration to the lines besides upgrades in-kind is the rerouting of the Tracy-Los Banos line to the Tracy Substation. The Tracy-Los Banos line joins its historic alignment about one mile southeast of the Tesla Substation, which is approximately 50 miles northwest of the project APE. Therefore, the alignment running through the study area retains the historic alignment of the Pacific Intertie.

The JRP recorded segments are the same lines as those that run through the study area and are on identical H-type tower structures. Therefore, JRP's conclusion is substantial enough to be applicable to the segments of the two transmission lines within the study area. The segments of the Tesla-Los Banos #1 and Tracy-Los Banos 500 kV EHV Transmission Lines/Pacific Intertie within the study area appear eligible for listing in the NRHP or the CRHR. The structures were evaluated in accordance with Section 15064.5 (a)(2)-(3) of CEQA Guidelines and using the criteria outlined in Section 5024.1 of the PRC and are historical resources for the purposes of CEQA.

Summary of Archaeological Resources

Unique Archeological Resources is a term with a defined statutory meaning (see *Section 3.6.2, Regulatory Framework, CEQA, Unique Archeological Resources*, for the full definition of unique archeological resource as identified by PCR Section 21083.2 (g)). As a result of the survey and evaluation of all archaeological sites in the APE, one Unique Archaeological Resource was identified within the APE.

Site P-50-344 is a prehistoric occupation site consisting of four bedrock mortars and cupule features, an artifact surface scatter of lithic debitage (stone chips and flakes from making stone tools), groundstone (a stone tool for grinding) fragments, and one obsidian biface tool fragment located along the slope and base of a hill overlooking Del Puerto Creek to the south. Subsurface testing at the site identified a deposit of lithic debitage, a bone awl fragment, burned faunal material, freshwater mussel shell fragments and marine shell beads. The features and artifact deposit at the site are indicative of habitation along Del Puerto Creek, containing information important in prehistory, specifically to the prehistoric inhabitants of the local area. Because the site contains information important in prehistory (Criterion 4), and retains enough integrity to convey its significance, it appears eligible for listing in the NRHP and CRHR. The site was evaluated in accordance with Section 15064.5 (a)(2)-(3) of CEQA Guidelines and using criteria outlined in Section 5024.1 of the PRC and is an Archaeological Resource for the purposes of CEQA.

3.6.2 Regulatory Framework

This section describes laws and regulations at the state and local level that apply to the proposed project.

State Policies and Regulations

CEQA

Historical Resources

"Historical resource" is a term with a defined statutory meaning (PRC Section 21084.1); determining significant impacts on historical and archaeological resources is described in the State CEQA Guidelines, Sections 15064.5[a] and [b]. Under State CEQA Guidelines Section 15064.5(a), the following resources are considered historical:

1) A resource listed in, or determined to be eligible by the State Historical Resources Commission for listing in, the California Register of Historical Resources (CRHR) (PRC Section 5024.1) will be presumed to be historically significant.
2) A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the PRC or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the PRC, will be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
3) Any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource will be considered by the lead agency to be historically significant if the resource meets the following criteria for listing in the CRHR (PRC Section 5024.1):
    a) is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
    b) is associated with the lives of persons important in our past;
    c) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
    d) has yielded, or may be likely to yield, information important in prehistory or history.
4) The fact that a resource is not listed in or determined to be eligible for listing in the CRHR, not included in a local register of historical resources (pursuant to Section 5020.1[k] of the PRC), or not identified in a historical resources survey (meeting the criteria in Section 5024.1[g] of the PRC) does not preclude a lead agency from determining that the resource may be a historical resource as defined in PRC Section 5020.1(j) or 5024.1.

Unique Archeological Resources

CEQA also requires lead agencies to consider whether projects will affect unique archaeological resources. PRC Section 21083.2, subdivision (g), states that a unique archaeological resource is 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) It contains information needed to answer important scientific research questions, and there is a demonstrable public interest in that information.
2) It has a special and particular quality, such as being the oldest of its type or the best available example of its type.
3) It is directly associated with a scientifically recognized important prehistoric or historic event or person.

Tribal Cultural Resources

See *Section 3.14, Tribal Cultural Resources*, for information regarding the regulations and policies governing Tribal Cultural Resources.

California Register of Historical Resources

All properties in California that are listed in or formally determined eligible for listing in the NRHP are eligible for listing in the CRHR. The CRHR is a listing of state of California resources that are significant within the context of California's history. The CRHR is a statewide program with a scope and criteria for inclusion similar to those used for the NRHP. In addition, properties designated under municipal or county ordinances are also eligible for listing in the CRHR.

A historical resource must be significant at the local, State, or national level under one or more of the criteria defined in the CCR Title 15, Chapter 11.5, Section 4850 to be included in the CRHR. The CRHR criteria are similar to the NRHP criteria and are tied to CEQA because any resource that meets the criteria below is considered a significant historical resource under CEQA. All resources listed in or formally determined eligible for listing in the NRHP are automatically listed in the CRHR.

The CRHR uses four evaluation criteria:

1. It is associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.
2. It is associated with the lives of persons important to local, California, or national history.
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values.
4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

Similar to the NRHP, a resource must meet one of the above criteria and retain integrity. The CRHR uses the same seven aspects of integrity as the NRHP.

California Native American Historical, Cultural, and Sacred Sites Act

The California Native American Historical, Cultural, and Sacred Sites Act applies to both State and private lands. The act requires that upon discovery of human remains, construction or excavation activity must cease and the County coroner must be notified. If the remains are of a Native American, the coroner must notify the NAHC, which notifies and has the authority to designate the Most Likely Descendant of the deceased. The act stipulates the procedures the descendants may follow for treating or disposing of the remains and associated grave goods.

Health and Safety Code, Sections 7052 and 7050.5

Section 7052 of the Health and Safety Code states that the disturbance of Native American cemeteries is a felony. Section 7050.5 requires that construction or excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If they are determined to be those of a Native American, the coroner must contact the NAHC.

Public Resources Code, Section 5097

PRC Section 5097 specifies the procedures to be followed if human remains are unexpectedly discovered on nonfederal land. The disposition of Native American burial falls within the jurisdiction of the NAHC. Section 5097.5 of the PRC states:

> No person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

Assembly Bill 52

AB 52, signed by the California governor in September of 2014, establishes a new class of resources under CEQA: "tribal cultural resources." Please refer to *Section 3.14* for the discussion regarding AB 52 and tribal cultural resources.

Local Policies and Regulations

Stanislaus County

Stanislaus County has identified the following goals and policies relevant to cultural resources in Chapter 3 - Conservation Element, of the General Plan (Stanislaus County 2016):

Policy Twenty-Four:

The County will support the preservation of Stanislaus County's cultural legacy of historical and archeological resources for future generations. (Comment: Landmarks of historical consequence not only include old schoolhouses, and covered bridges, but also such sites as Native American burial grounds, cemeteries, pottery, rock carvings, and rock paintings. Normally, "sensitive" areas are often located near natural watercourses, springs or ponds, or on elevated ground. However, due to the silt build-up in the valley and the meandering of rivers, archaeological and historical sites may be found in unsuspected areas.)

Relevant Implementation Measures:

3. The County shall work with the County Historical Society, and other organizations and interested individuals to study, identify and inventory archeological resources and historical sites, structures, buildings and objects.
4. The County will cooperate with the State Historical Preservation Officer to identify and nominate historical structures, objects, buildings and sites for inclusion under the Historical Preservation Act.
5. The County shall utilize the California Environmental Quality Act (CEQA) process to protect archaeological or historic resources. Most discretionary projects require review for compliance with CEQA. As part of this review, potential impacts must be identified and mitigated.
6. The County shall make referrals to the State Office of Historic Preservation and the Central California Information Center as required to meet CEQA requirements.

3.6.3 Impact Analysis

Methodology for Analysis

This section describes the potential impacts of the proposed project on cultural resources and describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided, where feasible and appropriate.

Potentially significant environmental impacts on eligible historic-built resources and the assumed eligible prehistoric archaeological resources identified in *Section 3.6.1, Environmental Setting*, as a result of construction and operation of the proposed project are qualitatively assessed in this section. The criteria used to evaluate potentially significant impacts are defined in *Section 3.6.2, Regulatory Framework*, *CEQA* and *Public Resources Code Section 5097*.

Because the Bureau of Reclamation may issue federal funding for the proposed project, a federal Section 106 cultural resources consultation process with interested tribes and the State Historic Preservation Office (SHPO) is being undertaken, Reclamation will prepare a NEPA document analyzing the potentially significant environmental effects of the proposed project and prepare a Section 106 consultation report that evaluates potentially significant environmental effects on eligible cultural resources.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines,* as updated in December 2018, an impact on cultural resources would be considered significant if the project would:

- Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5.
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5.
- Disturb any human remains, including those interred outside of dedicated cemeteries.

For purposes of discussion throughout the following impacts and mitigation measures, the term "historic resources" includes extant architectural resources (e.g., buildings and structures), historic landscapes, and subsurface historic-era features (such as wells, privies, or foundations). "Prehistoric resources" refers to Native American sites, features, or burials.

Impacts and Mitigation Measures

Impact CULT-1 Substantial Adverse Change in the Significance of a Historical Resource

Construction and Operation Impacts

The proposed project could result in temporary construction-related impacts on the DMC, the Aqueduct, and the Pacific Intertie. Construction-related activities have the potential to transmit ground-borne vibration to these historic built resources and could result in operational impacts on the Delta Mendota Canal (DMC) and the Pacific Intertie because of modifications to the existing infrastructure.

Construction activities would result in temporary impacts related to ground disturbing activities and attachment of pumps and facilities to the DMC. Permanent changes under operations to the DMC would result by rerouting a portion of its flows from the DMC via project elements. However, the function, alignment and the rural setting of the DMC would not be altered by either construction or operation of the proposed project. The DMC was designed to deliver water via various intakes and laterals, and the new intake pipeline and related facilities proposed by the project do not differ greatly from these other water supplying features. As no character defining features that qualify the DMC as a historical resource would be damaged by the construction or operation of the project, the project would have a less-than significant impact on the DMC.

Construction activities have the potential to result in temporary ground disturbances near the Aqueduct. However, construction would occur via subterranean tunneling under the Aqueduct and there would be no permanent changes made to the Aqueduct. Therefore, the function, setting and alignment of the resource would remain intact. As no character defining features that qualify the Aqueduct as a historical resource would be damaged by the construction or operation of the project, the proposed project would have a less-than significant impact on the Aqueduct.

A portion of the Pacific Intertie would be relocated as a result of the proposed project if towers cannot be raised to allow the transmission lines to cross the reservoir. This relocation would change the historic alignment of the two transmission lines that compose part of the Pacific Intertie. This would permanently change the alignment of approximately 0.7 miles of the Pacific Intertie. The relocation would have no long-term operational effects, and the change in alignment location would be relatively minor and close to the original alignment (approximately 0.6 miles to the east). The relocated section of the Pacific Intertie would remain in a rural setting, and the Pacific Intertie would continue to transmit EHV 500 kV electricity. This minor relocation means that no character defining features that qualify the Pacific Intertie as a historical resource would be significantly changed. The proposed project would therefore have a less-than-significant impact on the Pacific Intertie.

Significance before Mitigation

The proposed project would not result in construction or operational impacts to the three historic built resources because it would not result in significant modifications to the qualities that establish these three resources as historic and therefore would have a less-than-significant impact on historic cultural resources within the study area. Therefore, no mitigation measures shall be required.

Mitigation Measures

None.

Impact CULT-2 Substantial Adverse Change in Significance of an Archaeological Resource

Impact CULT-2 is addressing relevant sections of Appendix G of the *CEQA Guidelines* §15064.5 and PRC Section 21083.2, as described in *Section 3.6.2, Regulatory Framework*, which include unique and historical archaeological resources. Activities associated with construction and operations of the proposed project would result in physical change to the one assumed eligible archaeological resource located in the study area, site P-50-0344. These activities have the potential to cause permanent physical damage to this resource as described below.

Construction and Operation Impacts

The proposed project could result in permanent physical damage to P-50-0344 during construction because of the potential that borrow material could be excavated from anywhere in the inundation area. Additionally, there is also the potential for previously unknown archaeological resources to be encountered during ground disturbing activities related to construction of the proposed project, and if this occurred, they could be adversely affected.

Operation-related impacts consists of inundation of the reservoir and fluctuating water levels. Inundation would cause significant damage to P-50-0344 as this archaeological resource is located completely within the proposed inundation area and inundation would submerge it. Therefore, the proposed project would have a significant impact on P-50-0344. Furthermore, if previously unknown archaeological resources are inundated and experience fluctuating water levels, they could be adversely affected.

Significance before Mitigation

Construction impacts to P-50-0344 would be permanent due to the destruction of the resource during grading within the inundation area. Operation impacts to P-50-0344 would also be permanent due to the inundation of the resource under water. These impacts would be significant because they would result in significant modifications to the qualities that make this resource a significant unique archeological resource. Furthermore, construction and operation impacts to unknown cultural resources could result in significant modifications to the character defining qualities.

Mitigation Measures

Mitigation Measure CULT-1: Treatment Plan for Site P-50-0344

Prior to construction, a Cultural Resources Treatment Plan shall be implemented for site P-50-0344. The treatment plan will establish the procedures and documentation needed to carry out data recovery for the resource. The treatment plan will include field methods required for data recovery excavations, requirements and procedures for recordation, analysis, curation, reporting, and any other documentation or methods used for adequately mitigating the site.

Collectively, the treatment plan shall characterize the nature of the assemblage and data potential at the site as well as synthesize and capture data that may be lost caused by the construction and operations impacts of the project.

Mitigation Measure CULT-2: Implement measures to protect previously unidentified cultural resources

Construction will stop if potential cultural resources are encountered. If signs of an archaeological site, such as any unusual or large amounts of bone, stone, ~~or~~ shell, lumber, ceramics, cans, bottles, or any other prehistoric (Native American) or historic cultural resources are uncovered during grading or other construction activities, work will be halted within 100 feet of the find and the Del Puerto Water District will be notified. A qualified archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeology shall be retained to evaluate the significance of the find and shall have the authority to modify the temporary no-work 100-foot radius as appropriate, using professional judgement. ~~will be consulted for an on-site evaluation.~~ If the site is or appears to be eligible for listing on the CRHR, additional mitigation, further testing for evaluation, and/or data recovery may be necessary. If the qualified archaeologist determines that the find does not represent a cultural resource, then work may resume immediately and no further agency coordination is required. During operations, a qualified archeologist will conduct a pedestrian survey of the reservoir shore (i.e., the primary area where the water level fluctuates) during periodic maintenance periods of the reservoir or facilities (once every 5-years). This pedestrian survey will identify if there are unknown buried archaeological resources that may have been exposed during water level fluctuations. If cultural resources are found, the archaeologist will determine whether the resource is or appears to be eligible for listing on the CRHR and may be significant pursuant to Appendix G of the *CEQA Guidelines* §15064.5 and PRC Section 21083.2. If the resources are determined to be eligible and significant, the archaeologist will recover the resource(s) pursuant to standard data recovery practices prior to the refilling of the reservoir.

Significance after Mitigation

Implementation of Mitigation Measure CULT-1 would not fully mitigate the significant impact to site P-50-0344 in that it would not prevent destruction of the site. Mitigation would capture information from the artifacts present at the site, but the project would still result in significant modifications to the qualities that make this resource a significant unique archeological resource; therefore, impacts would be significant and unavoidable. Implementation of Mitigation Measure CULT-2 would minimize potential project impacts on previously unknown archaeological resources, but if any of those resources are within the reservoir inundation area and are determined to be significant or unique resources, impacts could not be reduced to a less-than significant level. There is no mitigation set in place for the permanent construction or operational impacts on the unknown prehistoric cultural resources, as such impacts would be unavoidable.

Impact CULT-3 Disturbance of Human Remains

Construction and Operation Impacts

The results of the records search, Native American outreach, and the pedestrian surveys indicated that human remains are not present in the study area. However, there is always the possibility that ground-disturbing activities during construction may uncover previously unknown buried human remains. Operational activities would not result in ground disturbing activities and therefore do not have the potential to affect human remains. Should human remains be discovered during construction, this impact would be potentially significant.

Significance before Mitigation

Impacts would be potentially significant if human remains are discovered during construction.

Mitigation Measures

Mitigation Measure CULT-3: Implement measures if construction activities inadvertently discover or disturb human remains

If human remains are discovered during any stage of construction, including disarticulated or cremated remains, the construction contractor will immediately cease all ground-disturbing activities within 100 feet of the remains and notify the Del Puerto Water District and the Stanislaus County Coroner. In accordance with California Health and Safety Code section 7050.5, no further disturbance will occur until the following steps have been completed:

- The Stanislaus County Coroner has made the necessary findings as to the origin and disposition pursuant to Public Resources Code section 5097.98.
- If the remains are determined by the County Coroner to be Native American, the Coroner shall notify NAHC within 24 hours.

A professional archaeologist with Native American burial experience will conduct a field investigation of the specific site and consult with the most likely descendant, if any, identified by the NAHC. As necessary and appropriate, the professional archaeologist may provide technical assistance to the most likely descendant, including the excavation and removal of the human remains.

Significance after Mitigation

By ceasing all ground-disturbing activities in the location of the human remains discovery and following the protocol outlined in Mitigation Measure CULT-3, the impacts would be reduced to a less-than significant level.

Cumulative Impact Analysis

The geographic scope of the cumulative impacts on cultural resources encompasses the study area and surrounding areas. Impacts to the three historic-built environment resources would be less than significant because they would not permanently modify the qualities that establish these resources as eligible and thus would not result in an incremental contribution to a cumulative effect. The projects listed in 3.0-1 also are unlikely to permanently modify qualities of existing infrastructure such as the transmission lines. Therefore, the proposed project when combined with other projects would not have a significant cumulative impact on historic-built resources.

The three projects identified on **Table 3.0-1** are all projects that have the potential to result in ground disturbing activities and thus have the potential to disturb unknown prehistoric or historic archaeological sites or human remains. However, projects, including the proposed project would have to follow the law regarding human remains and incorporate actions such as those described above in Mitigation Measure CULT-3. In addition, the implementation of Mitigation Measure CULT-2 would reduce the incremental effect on unknown resources to less than significant. However, the project would still have a significant impact to the archaeological resource P-50-0344. Therefore, when combined with other projects listed in **Table 3.0-1** the proposed project would result in an incremental contribution to cumulative effects and impacts would be cumulatively considerable.

Significance Determination

Impacts on historic-built cultural resources, human remains, or unknown archaeological cultural resources would not be cumulatively considerable or significant for the reasons described above when combined with projects listed in **Table 3.0-1**. However, impacts would be significant and cumulatively considerable on the archaeological resource P-50-0344 because it would permanently remove this resource. Mitigation measures could not reduce this cumulative effect because there are no measures to preserve or otherwise maintain P-50-0344 that would be permanently destroyed either through mitigation measure CULT-1 or during construction or operation.

Mitigation Measures

See **Mitigation Measures CULT-1**, **CULT-2, and CULT-3**.

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3.7 Energy Resources

This section evaluates the potential impacts to energy resources associated with implementation of the proposed project. For the purpose of this analysis, the study area includes the area that would supply energy required or consumed by the facilities to be constructed or relocated under the proposed project.

3.7.1 Environmental Setting

The discussion below describes the conditions of the region and study area related to energy resources, and information on the energy resources of the area that would be affected by the proposed project.

California Setting

California has a diverse portfolio of energy resources, including crude oil, natural gas, and renewable resources, such as geothermal, solar, and wind. Energy efficiency efforts have dramatically reduced statewide per capita energy consumption relative to historical averages. According to the U.S. Energy Information Administration (2019), per capita energy consumption in California is among the lowest in the country, ranking 48th among all states in the county in 2016. In 2017, renewable resources accounted for the majority of energy produced (42 percent), followed by crude oil (39 percent), natural gas (9 percent), nuclear electric power (7 percent), and a variety of other sources (U.S. Energy Information Administration 2019). Additionally, with the passage of California Senate Bill (SB) 100 in 2018, California will be required to obtain 100 percent of its retail electricity from renewable sources by 2045.

Despite reductions in per capita use, the state's total overall energy consumption is expected to increase over the next several decades due to growth in population, jobs, and demand for vehicle travel (U.S. Energy Information Administration 2018).

Regional Setting

Stanislaus County is served by three energy providers: Pacific Gas and Electric (PG&E), Modesto Irrigation District (MID), and Turlock Irrigation District (TID). Regionally, PG&E has a diverse power production portfolio, which is comprised of a mix of renewable and non-renewable sources. On a smaller scale, MID and TID also rely on a diverse portfolio of energy sources to serve their customers.

TID provides power to the study area and would likely supply energy required for project operation. TID has various generating facilities including small and large hydroelectric facilities, natural gas power plants, and wind and solar projects. TID has adopted a goal of 60 percent renewable energy by 2030, and has made sustainable investments in renewable energy sources (TID 2018). TID serves a large portion of southern Stanislaus County extending from Don Pedro Lake to Santa Clara County, plus small adjacent portions of northern Merced County. The proposed pumping plant site is within TID's service area.

In 2015, TID entered into a 20-year agreement to purchase 54 megawatts of renewable solar power generated at the Rosamond Solar site in Kern County, which is expected to generate energy sufficient to power approximately 20,000 homes (TID 2019a). The Tuolumne Wind Project, which began commercial operation in 2009, has added a significant amount of renewable energy to TID's portfolio and has been recognized as one of the most productive wind resources in the Western United States. The project, which is located in Klickitat County, in Washington state, consists of 62 turbines that generate a total of 136.6 megawatts (TID 2019b). TID is also the majority owner and operating partner of the Don Pedro Hydroelectric Project, which can generate up to 203 megawatts from its four generators (TID 2019c).

In addition to renewables, TID also has several natural gas power plants. The Almond II Power Plant, which opened in 2012, added 174 megawatts of output to TID's portfolio (TID 2018). Additionally, the Walnut Energy Center, which adds 250 megawatts of output, is among the cleanest power generating facilities of comparable size in the nation; its emissions are roughly 85 percent lower than similar facilities (TID 2018; TID 2019d).

Table 3.7-1 shows TID's electric resource portfolio as of 2018. These resources are supplemented with purchases from several power markets and other wholesale electric providers.

Table 3.7-1: Turlock Irrigation District Electric Resource Portfolio

Turlock Irrigation District Energy Resource Name	Capacity (MW)	Fuel Type	Resource is Renewable?
Don Pedro Power Plant	139.0	Hydroelectric	
La Grange Power Plant	5.3	Hydroelectric	X
Hickman Power Plant	1.1	Hydroelectric	X
Turlock Lake Power Plant	3.3	Hydroelectric	X
Dawson Power Plant	5.5	Hydroelectric	X
Walnut Power Plant	49.6	Natural Gas	
Almond Power Plant	48.3	Natural Gas	
Almond 2 Power Plant	174.0	Natural Gas	
Walnut Energy Center	250.0	Natural Gas	
Tuolumne Wind Project	136.6	Wind	X
Northern California Power Agency's Geothermal Plant	7.0	Geothermal	X
Western Area Power Administration Power Purchase Agreement	4.0	Hydroelectric	
Boardman Power Purchase Agreement	59.0	Coal	
Rosamond West Solar 2 Power Purchase Agreement	54.0	Solar	X
Loyalton Biomass Power Purchase Agreement	0.8	Biomass	X

For the period of 2018 to 2030, TID is anticipating their energy load to grow on average 0.4 percent per year and peak demand to grow on average 0.1 percent per year, reaching approximately 2,300,000 megawatt-hours (MWh) and 542 megawatts, respectively, by 2030 (TID 2018). Several of TID's energy resources are located within their service area, which helps increase electric system reliability in meeting these future demands.

3.7.2 Regulatory Framework

This section describes federal, state, and local laws and regulations that may apply to the project.

Federal Policies and Regulations

National Energy Conservation Policy Act

The National Energy Conservation Policy Act serves as the underlying authority for federal energy management goals and requirements. Signed into law in 1978, it is regularly updated and amended by subsequent laws and regulations. This act is the foundation of most federal energy requirements.

National Energy Policy Act of 2005

The National Energy Policy Act of 2005 sets equipment energy efficiency standards and seeks to reduce reliance on nonrenewable energy resources and provide incentives to reduce current demand on these resources. For example, under the Act, consumers and businesses can attain federal tax credits for purchasing fuel-efficient appliances and products, including hybrid vehicles; constructing energy-efficient buildings; and improving the energy efficiency of commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment. Executive Order 13423 (Strengthening Federal Environmental, Energy, and Transportation Management), signed in 2007, strengthens the key energy management goals for the federal government, and sets more challenging goals than the Energy Policy Act of 2005. The energy reduction and environmental performance requirements of Executive Order 13423 were expanded upon in Executive Order 13514 (Federal Leadership in Environmental, Energy, and Economic Performance) signed in 2009 (Federal Register 2009).

U.S. Department of Energy Integral Horsepower Motor Rule (10. CFR Part 431)

The U.S. Department of Energy (DOE) Integral Horsepower Motor Rule, effective as of June 1, 2016, establishes efficiency requirements that cover 1-500 horsepower (Hp) (0.75 370 kW) three phase electric motors. This law superseded the existing Energy Independence and Security Act of 2007. Several categories of motors were previously covered at lower efficiency levels or exempt.

The motors regulated under the expanded scope meet the following nine characteristics:

1. Is a single speed motor
2. Is rated for continuous duty (MG 1) operation or for duty type S1 (IEC)
3. Contains a squirrel-cage (MG 1) or cage (IEC) rotor
4. Operated on polyphase alternating current (AC) 60-hertz sinusoidal line power
5. Has 2-, 4-, 6-, or 8-pole configuration
6. Is rated 600 volts or less
7. Have a three or four-digit NEMA frame size (or IEC metric equivalent), including those designs between two consecutive NEMA frame sizes (or IEC metric equivalent) or an enclosed 56 NEMA Frame size (or IEC metric equivalent)
8. Has no more than 500 horsepower, but greater than or equal to 1 horsepower (or kilowatt equivalent)
9. Meets all the performance requirements of a NEMA design A, B or C electric motor or an IEC design N or H electric motor

As indicated above, the voltage range for motors covered by the scope of the policy includes those less than 600 volts, and less than 500 Hp. Submersible motors are not covered under this rule (CFR 2019).

State Policies and Regulations

California Energy Action Plan

California’s Energy Action Plan II, developed by the CPUC and the California Energy Commission (CEC), is the state’s principal energy planning and policy document (CPUC and CEC 2005). The plan describes a coordinated implementation plan for state energy policies and refines and strengthens California’s original Energy Action Plan I published in 2003. California Energy Action Plan II identifies specific action areas to ensure that California’s energy is adequate, affordable, technologically advanced, and environmentally sound. It adopts a loading order of preferred energy resources to meet the state's needs and reduce reliance on natural gas and other fossil fuels, also important for achieving greenhouse gas (GHG) emission reductions from the electricity sector.

The plan identifies energy efficiency and demand response[1] as the primary ways to meet the energy needs of California's growing population, and it identifies renewable energy and distributed generation[2] as the best ways on the supply side. To the extent that energy efficiency, demand response, renewable resources, and distributed generation are unable to satisfy increasing energy and capacity needs, CEC supports clean and efficient fossil fuel-fired generation. The 2008 Energy Action Plan Update provided a status update to the 2005 Energy Action Plan II and continues the goals of the original California Energy Action Plan (CPUC and CEC 2008).

California Energy Code

The California Energy Code, also referenced as California Building Energy Efficiency Standards, contains energy conservation standards applicable to most residential and nonresidential buildings throughout California. California's energy code is designed to reduce wasteful and unnecessary energy consumption in newly constructed and existing buildings. The CEC updates the Building Energy Efficiency Standards (Title 24, Parts 6 and 11) every three years in a public process (CEC 2019a). Title 24 presents a set of requirements for energy conservation in building design, construction, and retrofit, that apply to identified structural, mechanical, electrical, HVAC, and plumbing elements.

Senate Bill 100

SB 100, passed into law in 2018, accelerated the state's timeline for moving to renewable energy and carbon-free energy sources. SB 100 established renewable energy portfolio standards for power providers, mandating all retail electricity come from 100 percent renewable electricity sources by 2045. The policy requires that the transition to a zero-carbon electric system does not cause or contribute to increases of GHG emissions elsewhere in the western electricity grid (CEC 2019b). In addition to the 2045 target, SB 100 also requires electric utilities and other service providers to generate 60 percent of their power from renewable sources by 2030, up from the former 50 percent goal set for that date by SB 350, which was signed in 2015.

State Alternatives Fuels Plan

The State Alternatives Fuel Plan (California Air Resources Board [CARB] and CEC 2007) presents strategies and steps that California must take to increase the use of alternative non-petroleum fuels. The plan recommends alternative fuel targets of 9 percent in 2012, 11 percent in 2017, and 26 percent by 2022. The plan also presents a 2050 vision that extends the plan outcomes and presents a transportation future that greatly reduces the energy needed for transportation, provides energy through a diverse set of transportation fuels, eliminates over-dependency on oil, and achieves an 80 percent reduction in GHG emissions. With these goals, more than 4 billion gasoline gallon equivalents (20 percent) would be displaced by alternative fuels in 2020. CEC estimates that by 2050, alternative fuels could provide more than half of the energy needed to power California's transportation system.

Local Policies and Regulations

Stanislaus County Code

As described in the Stanislaus County Code, Title 16: Building and Construction, Chapter 16.65: Energy Code, Stanislaus County has adopted the California Energy Code, as published by the International Code Council, 2016 Edition, and Appendix 1-A as the Energy Code of the County. (Stanislaus County 2017).

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1 Demand response is the reduction of customer energy usage during peak periods in order to address system reliability and support the best use of energy infrastructure.

2 Distributed generation is electrical generation and storage that is performed by a variety of small, grid-connected or distribution system connected devices referred to as distributed energy resources.

3.7.3 Impact Analysis

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to energy resources. The analysis is based on a review of relevant project documentation and existing federal, state, and local regulations. It considers the extent to which the proposed project would result in significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources. It also considers the proposed project's consistency with existing state and local regulations in the locations where facilities would be modified or constructed.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines,* as updated in December 2018 an impact on energy would be considered significant if the project would:

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation;
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Analysis of energy impact includes providing information about energy impacts consistent with Appendix F of the CEQA Guidelines.

Impacts and Mitigation Measures

Impact ENE-1 Inefficient, Wasteful, Or Unnecessary Use of Energy Resources

Construction Impacts

Project construction, including construction of the reservoir and conveyance facilities and the relocation of the roadway and utilities, would require the use of fuels (primarily gas, diesel, and motor oil) for a variety of construction activities, including excavation, grading, and vehicle travel. During these activities, fuel for construction worker commute trips would be minor in comparison to the fuel used by construction equipment. While the precise amount of construction and operation-related energy consumption is uncertain, it is estimated that project construction would require about 4.52 million gallons of fuel over the entire construction period, which would be consumed by construction equipment, worker vehicles, and trucks that would deliver materials and equipment; this estimate is based on projected timing and usage factors for each element of construction. The vast majority of fuel consumption would be for construction vehicles and equipment with about 575 gallons of fuel projected to be used for worker vehicles. The Project Description provides information on construction equipment use, and construction trips associated with each project facility.

The use of fuels during construction would not be wasteful or unnecessary in nature because their use is necessary to contribute to the long-term distribution, use, and reliability of water resources within the study area. Because of the high cost of fuels, contractors have a built-in incentive to use minimize energy use and use fuel efficient. However, it is acknowledged that excessive idling and other inefficient site operations during construction could result in the inefficient use of fuels. Therefore, impacts related to the inefficient use of fuels during construction are considered to be potentially significant. As discussed in *Chapter 3.3, Air Quality*, the project would comply with San Joaquin Valley Air Pollution Control District (SJVAPCD) basic construction measures and CARB regulations on vehicle idling, which would require that equipment is properly tuned and that restrictions on idling are enforced. Mitigation efforts discussed in *Chapter 3.3, Air Quality* would reduce the impacts related to the inefficient use of construction-related fuels to less than significant. Implementation of **Mitigation Measure AIR-1** would reduce NOx emissions through on-site mitigation measures through a variety of means including measures to minimize energy use, thereby also enhancing energy efficiency and preventing energy waste.

Operation Impacts

Conveyance Facilities

The pumping plant would consist of up to five 300-cubic-feet-per-second (cfs), constant speed vertical turbine pumps, which would be powered by electricity provided by TID. Each pump would be driven by a 2,500 Hp motor, for a total installed Hp of up to 12,500 Hp. Each pump is estimated to operate with a motor efficiency rate of 96 percent efficiency rate and operate continuously for six months a year (September through March). With five pumps installed, a total of 38,695,020 kilowatt-hours (kWh) per year would be required to power the pumps. Lighting and ventilating systems would comply with Title 24 standards for energy efficiency.

In addition, the pumping plant would include one 500 kilo-volt-ampere (kVA) transformer for facility loads operated at 480V. The transformer would operate at a 50 percent loaded status and would operate continuously, year-round, requiring a total estimated 1,752,000 kWh annually. In total, the estimated operational power requirements for the project conveyance facilities are 40,447,020 kWh per year. **Table 3.7-2** presents a breakdown of the power requirement calculation assuming five pumps in operation.

Table 3.7-2: Conveyance Facility Operational Power Requirements

Equipment	Motor Rated Hp	Brake Hp[1]	Hp Consumed	kW	Quantity[2]	Daily Power Requirements (kWh)	Annual Power Requirements (kWh)[3]
Vertical Turbine Pump	2,500	2,280	2,375	1,772	5	212,610	38,695,020
500kVA Transformer	-	-	-	200	1	4,800	1,752,000
Total kWH							**40,447,020**

1 Brake HP data from Peerless quote for 60 cfs pumps; five pumps would be required.
2 A total of five pumps are assumed for this table.
3 Assuming six months operation for pumps and year-round operation for transformer.

Energy use to power the pumping plant would be highly efficient, as the project would be designed and maintained to maximize energy savings and eliminate operational inefficiencies. The proposed project would utilize high-efficiency equipment and is anticipated to have a motor efficiency of 96 percent. Energy use for pumping would be necessary to convey and meter raw water from the DMC to the reservoir and to control and meter return flow from the reservoir to the DMC, thus contributing to the project's purpose, to support the long-term storage and distribution of reliable water supply. For this reason, the operational impact of the conveyance facilities would not be inefficient, wasteful, or unnecessary.

Maintenance Trips

The project would require regular maintenance trips to perform routine inspections and maintenance tasks in accordance with design standards. Reservoir maintenance would include weekly inspection trips in the first year of operation, with the frequency of inspection reduced in years two through five to occur every two weeks. Starting in year six, maintenance trips would occur monthly. Operation and maintenance is estimated to require an average of one worker vehicle trip per day.

Depending on frequency of inspection, the fuel requirements of maintenance trips would range from 30 to 67 gallons of gasoline per year. This estimate assumes a 30-mile round trip to the reservoir site from the neighboring City of Patterson, and a vehicle fuel efficiency of 24 miles-per gallon (mpg), consistent with the average fuel efficiency of gasoline-powered light-duty truck use in Stanislaus County (CARB 2017).[3] **Table 3.7-3** presents estimated annual fuel requirements needed to perform project maintenance trips.

Table 3.7-3: Maintenance Trip Fuel Requirements

Operational Year	Frequency of Inspection	Trips Per Year	Travel Requirements (miles per year)	Annual Fuel Consumption (gal gasoline)
Year 1	Weekly	52	1,560	65
Years 2-5	Every two weeks	26	780	32.5
Years 6+	Monthly	12	360	15

Roadway Relocation

Due to roadway realignment, the project would result in longer travel distances for drivers traveling between Del Puerto Canyon Road/Diablo Grande Road and points east, resulting in an indirect operational impact through increased vehicle-miles traveled (VMT) and associated gasoline consumption. As discussed in *Traffic and Transportation (Section 3.13)*, total VMT would increase to 2,144 VMT an increase of 122 VMT per day, or six percent over the existing alignment.

Assuming an average fuel efficiency of 28.5 mpg, consistent with the average 2019 fuel efficiency of gasoline-powered passenger vehicle use in Stanislaus County (CARB 2017), the roadway relocation would result in an increase of four gallons of gasoline per day, or an additional 1,562 gallons per year, consumed by passenger vehicles travelling on the roadway. This represents approximately 0.6 percent of total fuel consumption for gasoline-powered passenger vehicles in Stanislaus County based on 2019 estimates from CARB's EMFAC emissions model (CARB 2017).

Utility Relocation

Once constructed, the relocated utilities would not require additional energy resources for operation as a result of the proposed project.

Significance before Mitigation

Impacts related to the inefficient use of fuels during project construction would be potentially significant before mitigation. Operational energy use of the project conveyance facilities would be minimized by the project's design specifications, which rely on high-efficiency equipment, and thus would not be wasteful or inefficient in nature. Further, energy use would not be unnecessary in nature, as the electricity required to convey the stored water is integral to the proposed project's purpose. As such, the impacts are considered less than significant. Additionally, based on the limited increase in VMT and corresponding fuel consumption, the impacts of the maintenance trips and roadway relocation are considered less than significant.

Mitigation Measures

See **Mitigation Measure AIR-1**, in *Chapter 3.3, Air Quality*. No other mitigation measures would be necessary.

Significance after Mitigation

With implementation of the energy efficiency measures included in Mitigation Measure AIR-1 to reduce NOx emissions, energy efficiency would be enhanced and energy waste would be reduced. Impacts

[3] Fuel efficiency estimates use the California Air Resources Board Mobile Source Emissions Inventory (MSEI) modeled estimates for light-duty trucks (less than 3,750 pounds) in Stanislaus County in 2019.

related to Inefficient, Wasteful, Or Unnecessary Use of Energy Resources would be less than significant. An explanation of how mitigation would reduce air quality impacts to less than significant is discussed in *Chapter 3.3, Air Quality*.

Impact ENE-2 Conflict or Obstruct a State or Local Plan

As discussed in *3.7.2, Regulatory Framework*, energy legislation, policies, and standards adopted by California and local governments were enacted and promulgated for the purpose of reducing energy consumption and improving efficiency. Compatibility of the proposed project's energy use with existing regulations is discussed below for federal, state, and local efficiency standards and policies.

Federal Efficiency Standards

DOE energy efficiency standards for motors established under the Integral Horsepower Motor Rule are not applicable for the size of pump motors required for the proposed project. However, other general-purpose motors that are in this category, such as exhaust fans, will be specified to meet government standards regarding energy efficiency.

State and Local Efficiency Requirements

The project will be constructed to maximize energy efficiency, in accordance with the Stanislaus County General Plan Goal 11, Policy 31, Implementation Measure 1: New County facilities should be designed to maximize energy efficiency. As discussed previously, the project design specifications rely on the use of high-efficiency equipment, including for the five 2,500 Hp motors that would power the pumping plant to convey water to and from the DMC.

Project lighting features would be compliant with the California Building Energy Efficiency Standards (Title 24), which have also been adopted locally as the Energy Code of the County. The reservoir itself would have no lighting, but lighting is anticipated for some facilities at the reservoir. The control building at the top of the reservoir and inlet/outlet works valve house, for example, may have lighting, and vaults are anticipated to have lighting with infrequent use. Light fixtures would be specified as LED type lamps utilizing solid state lighting controls, which are energy efficient lighting types. Additionally, lighting management systems would be specified that utilize solid state relays and digital clocks for controlling light operation and usage. It is expected that the use of lighting would be infrequent and used only as needed or for security purposes.

Significance before Mitigation

The project would be consistent with state and local plans based on its energy efficient design and compliance with California Building Energy Efficiency Standards (Title 24) and DOE energy efficiency standards for motors, where applicable. Project construction and operation would thus constitute a less-than-significant impact.

Mitigation Measures

No mitigation measures are required.

Cumulative Impact Analysis

Because the project would be served by TID, the geographic scope of the cumulative impacts on energy resources encompasses the TID service area. If the proposed project would result in a substantial impact on TID energy supplies that would require additional capacity, or would exceed TID's ability to meet peak demand, a significant cumulative impact could result. Initial coordination with TID indicates that they have sufficient capacity to serve the proposed project.

Significance Determination

As described in the impacts discussion above, energy use in project construction and operation would not be inefficient, wasteful, or unnecessary in nature, nor would the project conflict with a state or local plan.

Therefore, the contribution of the proposed project to cumulative impacts on energy resources in the study area would be minimal, as assessed by the criteria listed in Appendix G of the *CEQA Guidelines.* Energy for project operation is not expected to exceed TID's capacity for power generation, and because energy demand when pumping occurs would be constant and not subject to peaking, energy use is not projected to exceed TID's ability to meet peak demands. The cumulative impact is thus considered less than significant.

Mitigation Measures

No mitigation measures are required.

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3.8 Geology and Soils

This section evaluates the potential geology and soil impacts associated with implementation of the proposed project. The impact analysis evaluates the potential adverse impacts of the proposed project related to local geology, existing soil conditions, or seismicity that could result from the implementation of the proposed project. The analysis is based on a review of geologic maps and reports including geologic and geotechnical reports and information from state and local agencies.

3.8.1 Environmental Setting

This section describes the environmental and geologic setting, resources, and hazards within the project area, which includes geologic features at the project site and within the project vicinity that could affect project facilities.

The following subsections use information provided in the Seismicity and Geologic Hazards Evaluation prepared by Gannett Fleming on August 5, 2019 specifically for the proposed project. Additional information is provided in the Technical Memorandum, which can be found in Appendix E.

Regional Geology

California is broken into natural defined geologic regions that display a distinct landscape or landform. These regions, or geomorphic provinces, display defining features based on geology, faults, topographic relieve, and climate. The proposed project is located on the transition between the Coast Ranges Geomorphic Province and the Great Valley Geomorphic Province.

Coast Ranges Geomorphic Province

The Coast Ranges Geomorphic Province is distinguished by a series of tectonically controlled north-northwest trending ranges and valleys and extends for approximately 600 miles. The proposed project is located on the eastern flank of the Diablo Range, a mountain range within the Coast Range Geomorphic Province that extends southeast from the Carquinez Straight to Antelope Valley. The geology of the eastern flank of the Coast Range within the project area consists of a sequence of faulted, folded and in some cases mildly metamorphosed Upper Mesozoic (65 to 145 MA) primary marine sedimentary rocks knowns as the Great Valley Sequence, which rests unconformably on the underlying Franciscan Complex.

Great Valley Geomorphic Province

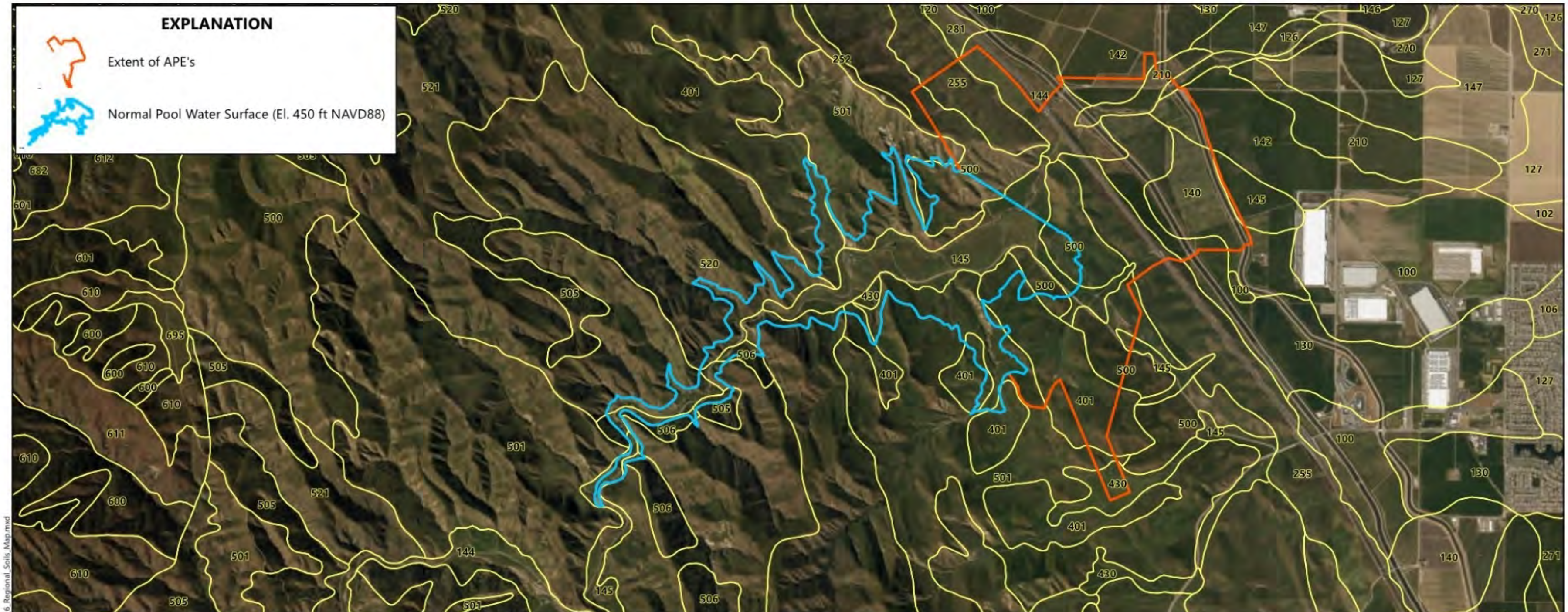
The Great Valley Geomorphic Province is a nearly featureless alluvial plain that extends north-northwest and encompasses the California Central Valley. It consists of a thick accumulation of marine and nonmarine clastic rocks of Jurassic to early Paleocene age. Sedimentation in the basin began around the late Jurassic (~145 Ma) and continued with little interruption through the Cretaceous and into the early Paleocene. Alluvial materials could present a geologic hazard to structures founded on them, if they are susceptible to liquefaction.

Soils

The United States Department of Agriculture (USDA) classifies agricultural land according to soil quality and irrigation status. Soil series are the base units of soil classification and are used in combination with other associated soil series to describe a soil association, which is implemented to map the locations, composition, and properties of soil formations throughout the state (CDC 2019).

Based on the University of California Davis Soil Resource Laboratory (UC Davis, 2019), there are 21 soil series (including rock outcrop, gullied land, and unnamed) within the project area, which have been identified and grouped into 18 numbered USDA soil associations (**Figure 3.8-1**).

Figure 3.8-1: Regional Soil Map



SOIL UNITS

SOIL ID #	SOIL ASSOSCIATION NAME	SOIL SERIES COMPOSITION (bold ≥ 85% of composition)	TYPICAL LANDFORMS	COMPOSITION	Slope %	Farmland Class	Drainage/Runoff/Permeability
130	Stomar Clay Loam, 0-2% slopes	**Stomar**-Capay-Vernalis-Zacharias	Alluvial fans/footslope/basin floor	clay loam	0-2%	Prime if Irrigated	well-drained/negligible-high/slow
140	Zacharias Clay Loam, 0-2% slopes	**Zacharias**-Capay-Stomar-Vernalis	Alluvial fans/footslope/stream terraces/basin floors	clay loam	0-2%	Prime if Irrigated	well-drained/negligible-medium/moderately slow
142	Zacharias Gravelly Clay Loam, 0-2% slopes	**Zacharias**-Capay-Stomar-Vernalis	Alluvial fans/footslope/stream terraces/basin floors	clay loam	0-2%	Prime if Irrigated	well-drained/negligible-medium/slow
144	Zacharias Gravelly Clay Loam, 2-5% slopes	**Zacharias**-Capay-Stomar-Vernalis	Alluvial fans/footslope/stream terraces/basin floors	clay loam	2-5%	Prime if Irrigated	well-drained/negligible-medium/moderately slow
145	Zacharias Clay Loam, 2-5% slopes	**Zacharias**-Alo-Cortina-Vernalis-Stomar-Vaquero	Alluvial fans/footslope/stream terraces/mountains	clay loam	2-5%	Prime if Irrigated	well-drained/negligible-medium/moderately slow
210	Cortina Gravelly Sandy Loam, 0-5% slopes, rarely flooded	**Cortina**-Xerofluvents-Xerorthents-Stomar-Zacharias	Alluvial fans/footslope	gravelly sandy loam	0-5%	Farmland of State Importance	excessively drained/negligible-low/rapid
252	Chaqua-Arburua Complex, 5-8% slopes	**Chaqua-Arburua**-San Timoteo-Wisflat-Zacharias	Backslope/hills/terraces/alluvial fans/mountains	fine-loamy	5-8%	Not Prime Farmland	well-drained/low-high/moderate
255	Calla-Carbona Complex, 30-50% slopes	**Calla-Carbona**-Arburua-San Timoteo-Wisflat	Terraces/backslope/hills/mountains	fine, loamy alluvium weathered from sandstone	30-50%	Not Prime Farmland	well-drained/low-high/moderately slow
270	Elsalado Fine Sandy Loam, 0-2% slopes, rarely flooded	**Elsalado**-Capay-Zacharias-Vernalis	Alluvial fans/footslope/basin floor	fine sandy loam	0-2%	Prime if Irrigated	well-drained/low/moderate
281	Carbona Clay Loam, 2-8% slope	**Carbona**-Stomar-Calla-Cortina-Vernalis	Alluvial fans/terraces/footslope	clay loam	2-8%	Prime if Irrigated	well-drained/low-very high/slow
401	Alo-Vaquero Complex, 30-50% slopes	**Alo-Vaquero**-Wisflat-Arburua-San Timoteo-Carbona	Montains/hills/backslope/terraces	Silty clay, weathered from sandstone	30-50%	Not Prime Farmland	well-drained/low-very high/slow
430	Vaquero-Carbona Complex, 8-30% slopes, MLRA 15	**Vaquero-Carbona**-Wisflat-Arburua-Gullied Land-San Timoteo	Mountain slopes/backslope/hillslope/terraces	clay loam	8-30%	Not Prime Farmland	well-drained/high-very high/slow
500	Wisflat-Arburua-San Timoteo Complex, 30-50% slopes	**Wisflat-Arburua-San Timoteo**-Ayar-Rock Outcrop	Hills/backslope	fine- to coarse-grained, loamy	30-50%	Not Prime Farmland	well-drained/medium-very high/moderately rapid
501	Wisflat-Arburua-San Timoteo Complex, 50-75% slopes	**Wisflat-Arburua-San Timoteo**-Rock Outcrop-Ayar	Mountains/mountain slope/backslope	fine- to coarse-grained, loamy	50-75%	Not Prime Farmland	well-drained/medium-very high/moderately rapid
505	Arburua-Contra Costa-Wisflat Complex, 30-50% slopes	**Arburua-Contra Costa-Wisflat**-Rock Outcrop-San Timoteo	Montains/hills/backslope	fine and coarse loamy clay	30-50%	Not Prime Farmland	well-drained/low-high/moderate
506	Arburua-Contra Costa-Wisflat Complex, 50-75% slopes	**Arburua-Contra Costa-Wisflat**-San Timoteo-Rock Outcrop	Montains/hills/backslope	fine and coarse loamy clay	50-75%	Not Prime Farmland	well-drained/low-high/moderate
520	Wisflat-Rock Outcrop Complex, 30-50% slopes	**Wisflat-Rock Outcrop**-Arburua-Unnamed-San Timoteo	Mountains/hills/backslope	Sandy loam	30-50%	Not Prime Farmland	well-drained/medium-very high/moderately rapid
521	Wisflat-Rock Outcrop Complex, 50-70% slopes	**Wisflat-Rock Outcrop**-Arburua-San Timoteo-Unnamed	Mountains/hills/backslope	Sandy loam	50-75%	Not Prime Farmland	well-drained/medium-very high/moderately rapid

Soils in the project area can be split broadly into two categories based on slope steepness:

1. Nearly level to gently sloping (0-8% slope) soils on hills, terraces, alluvial fans, footslopes and basin floors. Overall, these soils associations are well-drained, have low runoff potential, and slow to moderately-slow permeability, and fall into the farmland class of either Farmland of Statewide Importance, or Prime if Irrigated. The majority of these soil associations are located at and downslope of the proposed main dam.
2. Steep (8-75% slope) soils on mountain slopes, hills, terraces and backslopes. Overall, these soils associations are well-drained, have medium- to high runoff potential, and moderate- to moderately rapid permeability, and fall into the farmland class of Not Prime Farmland. The majority of these soil associations are found upslope of the proposed main dam.

Potential for Expansive Soils

Expansion and contraction of expansive soils in response to changes in moisture content can cause differential and cyclical movements that can cause damage and/or distress to shallow founded structures and equipment. Issues with expansive soils typically occur near the ground surface where changes in moisture content typically occur. The potential for shrink-swell conditions in the project area is not considered significant.

Seismicity

Faulting in the region is complex in that the area contains faults of several types and the interaction of these geologic structures has resulted in a complex history of late Cenozoic tectonic deformation (O'Connell et al, 2004). Furthermore, interpretation of this history is difficult because of an absence of well-dated late Cenozoic stratigraphic units and the fact that the geometries and activity rates of the concealed blind thrust faults must be inferred from surface observations.

Three main types of potentially active faults are documented near the project area: strike-slip faults associated with the Ortigalita fault zone; buried, west dipping blind-thrust faults associated with the uplifted eastern margin of the Diablo Range; and east-dipping bedding-plane reverse faults within the Great Valley sequence. See **Figure 3.8-2**, which shows faults near the proposed project site.

Table 3.8-1 lists selected potential fault sources located near the proposed project area. This table lists the active fault name, fault type, recency of movement, M_{max} value, and closest distance from the site and is based on USGS 2008 Update of the United States National Seismic Hazard Maps (Peterson et al, 2008). The values presented in the table below are provided for information of the ground motion levels that the project area may experience.

Notable historic earthquakes that have occurred along the western boundary of the Central Valley include the 1892 M~6.5 Vacaville-Winters and 1983 M6.4 Coalinga earthquakes (AECOM, 2016). The region is characterized by a high level of seismicity with the preponderance of events occurring along the San Andreas fault system west of the project area. **Figure 3.8-3** shows the historic recorded seismicity for earthquakes between M >1.0 up to M6.9 (ANSS ComCat, 2019). The most recent major earthquake in the project area is the 1989 M6.9 Loma Prieto event. The largest earthquake near the Project is believed to be the 1881 M6.1 earthquake. The estimated location of this event is about 10 km (6.2 mi) northwest from Del Puerto Canyon, the location is highly uncertain given its pre-instrumental age and is based on intensity estimates documented in the public record (AECOM, 2016).

Figure 3.8-2: Regional Fault Map

Document Path: O:\1-projects\2018\118-030.00_Del Puerto WD_Del Puerto Canyon Reservoir\GIS\MXD\EIR\Figure_7_Regional_Fault_Map.mxd

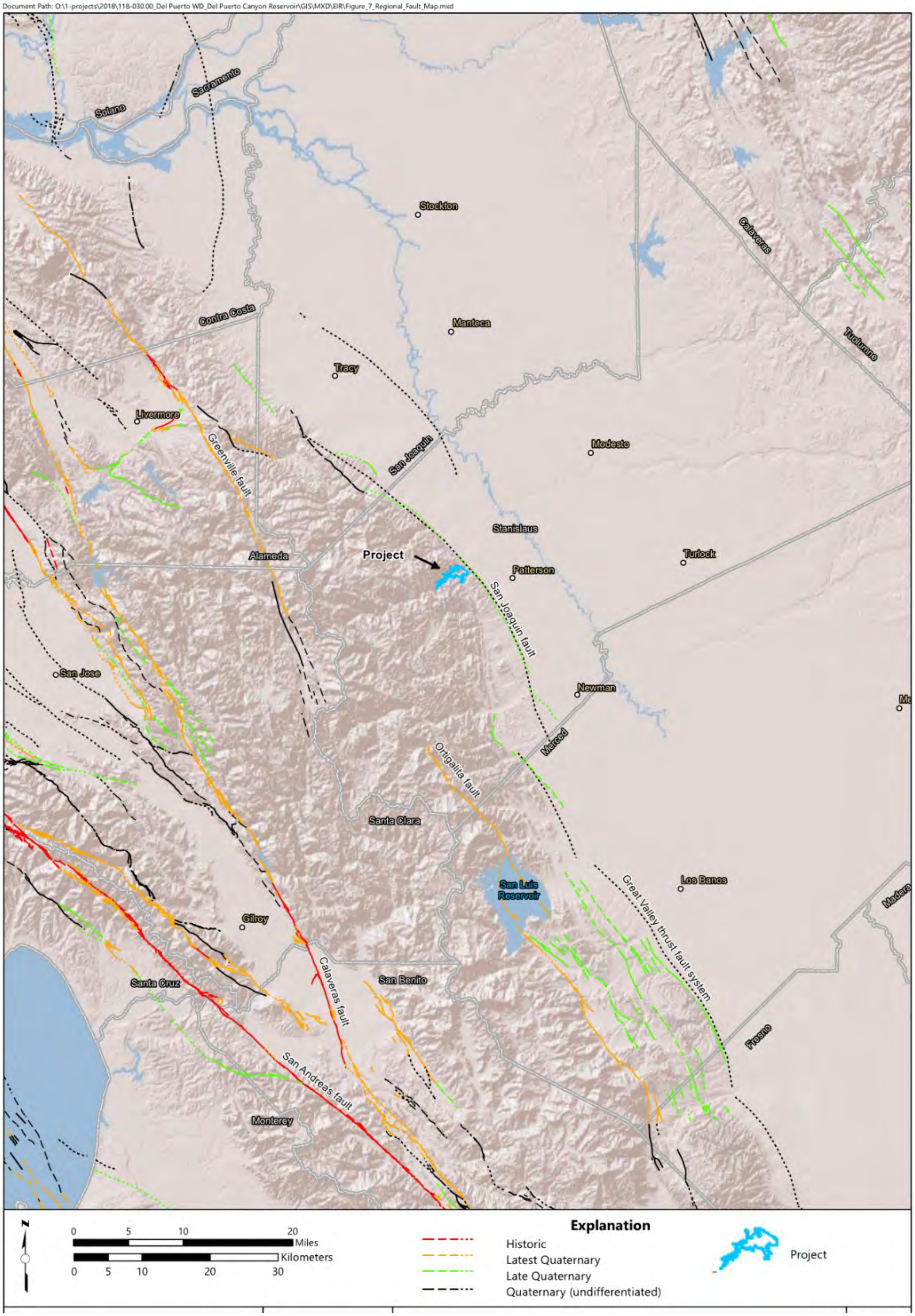


Figure 3.8-3: Regional Seismicity Map

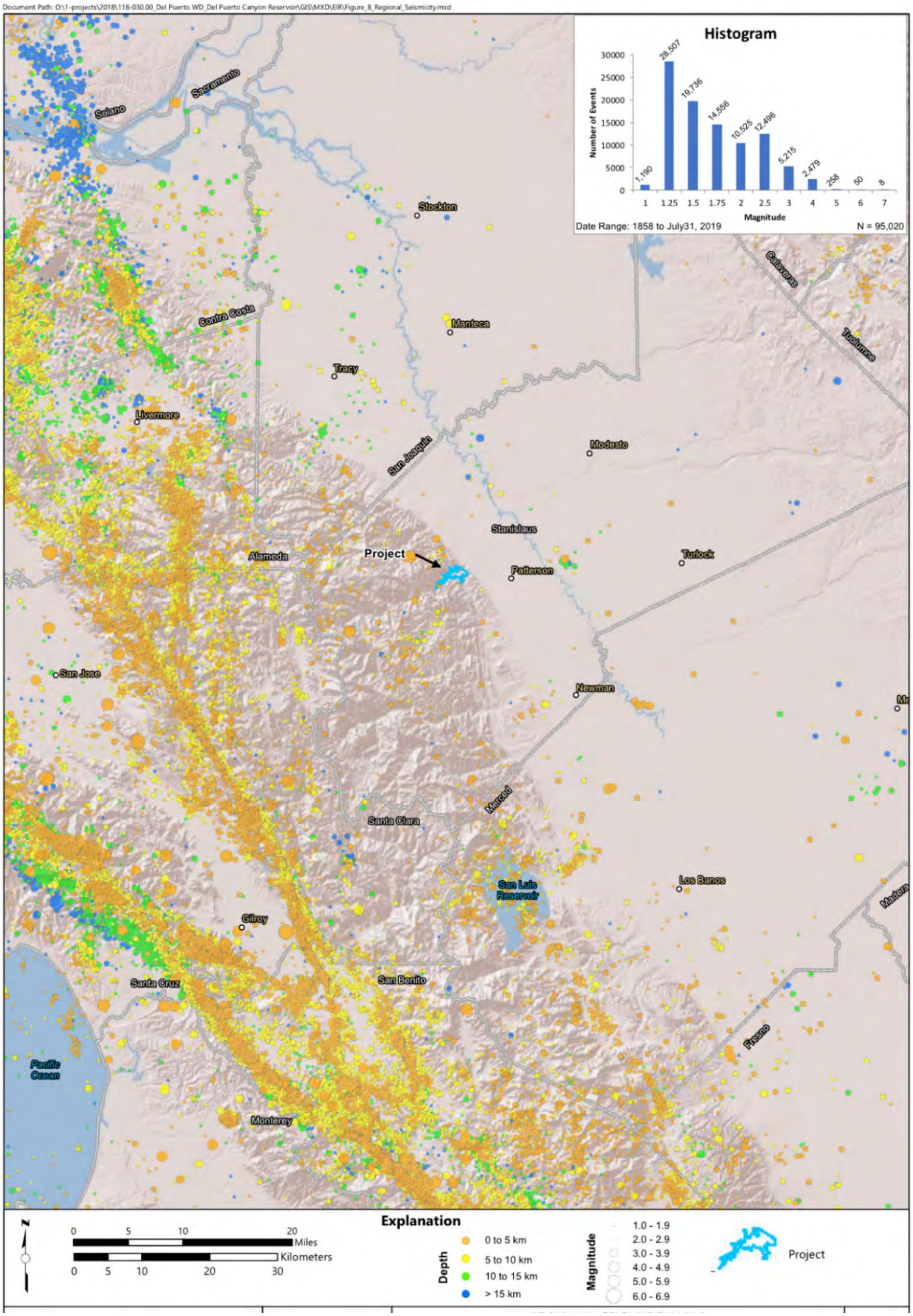


Table 3.8-1: Selected Potential Fault Sources Located Near the Proposed Project Area

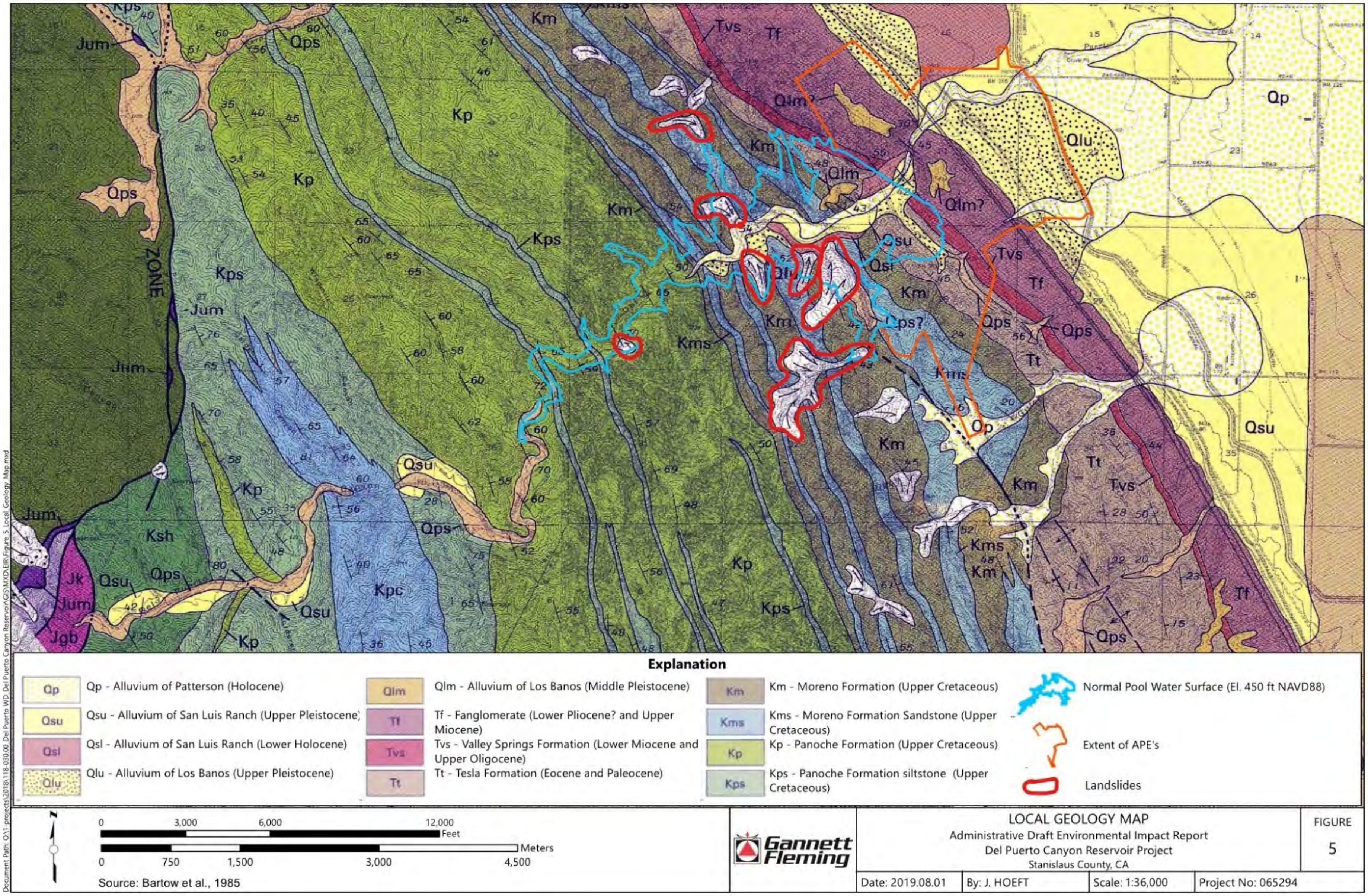
Fault	Fault Type	Recency of Movement	M_{max}	Approximate Distance to Dam (miles)
Great Valley 07/Orestimba (San Joaquin)	Reverse	Late Quaternary	6.6 to 6.9	0.2
Great Valley 08/Quinto (San Joaquin)	Reverse	Late Quaternary	6.6 to 6.8	4.6
Great Valley 09/Laguna Seca (San Joaquin)	Reverse	Late Quaternary	6.6 to 6.8	46.88
Ortigalita	Strike Slip	Latest Quaternary	6.9 to 7.1	24.7
Greenville Connected	Strike Slip	Undifferentiated Quaternary (<1.6 Ma)	6.8 to 7.0	29.5
Calaveras North + Central + South	Strike Slip	Holocene	6.84 to 7.03	47.0
Calaveras North + Central	Strike Slip	Holocene	6.8 to 7.0	47.0
San Andreas North + Peninsula +South	Strike Slip	Holocene	7.8 to 7.9	71.9

Landslides and Slope Failure

Landslides and other forms of slope failure form in response to the long-term geologic cycle of uplift, erosion, and disturbance of slopes. Landslides can be composed of soil, rock, or both, and can be classified based on type of movement (i.e., the displacement mechanism) and the type of material involved in a landslide. The classification of movement may comprise slides, spreads, flows, falls, and topples. These processes are commonly initiated by intense precipitation events in a natural setting. Strong shaking resulting from a nearby earthquake can also trigger landslides and rockfall. Debris flows and earth flows are other types of landslides that are characterized by soil and rock particles in suspension with water, and which often move with considerable speed. Debris flows often refer to flows that contain coarser soil and rock materials, while earth flows frequently refer to slides that are composed of predominantly finer grained materials.

A substantial number of landslides are found within and in the immediate vicinity of the reservoir inundation area. The majority of these landslides are located within units of the Cretaceous Moreno formation, upstream from the proposed main dam. At least seven landslides are mapped within the inundation area of the proposed reservoir six are in the Moreno formation and one landslide occurs in the Panoche formation (**Figure 3.8-4**).

Figure 3.8-4: Local Geology Map



Liquefaction and Lateral Spreading

Liquefaction is a process by which alluvium below the water table temporarily lose strength during an earthquake and behave as a viscous liquid rather than a solid. Liquefaction is restricted to certain geologic and hydrologic environments, primarily recently deposited alluvium (sand and silt) in areas with high groundwater levels. The process of liquefaction involves seismic waves passing through saturated granular layers, distorting the granular structure and causing the particles to collapse. This causes the granular layer to behave temporarily as a viscous liquid rather than a solid, resulting in liquefaction. Liquefaction can cause the soil beneath a structure to lose strength, which may result in the loss of foundation-bearing capacity and which could cause a structure to settle or tip. Liquefaction can also result in the settlement of large areas due to the densification of the liquefied deposit. Where structures are buried within liquefied deposits, the liquefaction can cause the structure to rise as a result of buoyancy.

Lateral spreading is lateral ground movement, with some vertical component, as a result of liquefaction. In effect, the soil rides on top of the liquefied layer. Lateral spreading can occur on relatively flat sites with slopes of less than 2 percent under certain circumstances and can cause ground cracking and settlement as a result of ground deformation.

Paleontological Resources

Paleontological sensitivity is a qualitative assessment based on paleontological potential of the stratigraphic units present, local geology and geomorphology, and other factors relevant to fossil preservation and potential yield. According to the Society of Vertebrate Paleontology (SVP) (2010), standard guidelines for sensitivity are (1) potential for a geological unit to yield abundant or significant vertebrate fossils or to yield a few significant fossils, large or small, vertebrate, invertebrate, or paleobotanical remains and (2) importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecological, or stratigraphic data. Sensitivity is ranked high, undetermined, low or none.

Unlike archaeological sites, which are narrowly defined, paleontological sites are defined by the entire extent (both areal and stratigraphic) of a unit or formation. In other words, once a unit is identified as containing vertebrate fossils, or other rare fossils, the entire unit is a paleontological site (SVP, 2010). For this reason, the paleontological sensitivity of geologic units is described and analyzed broadly, rather than being limited to county boundaries.

Although it is not possible to make a determination of the sensitivity for paleontological resources of each geologic unit because of the county's size, most of the geologic units are highly sensitive for paleontological resources. The University of California Museum of Paleontology (UCMP) database contains 765 records of vertebrate fossils found in the county (University of California Museum of Paleontology 2014a). <u>In the 1930s a hadrosaur (a type of duck-billed dinosaur) was found at the mouth Del Puerto Canyon; this is one of the earliest dinosaur fossil finds in California. Road cuts along lower Del Puerto Canyon Road are noted for the presence of leaf fossils.</u> In addition, most of the valley is immediately underlain by the Modesto and Riverbank Formations of Late Pleistocene (Wagner et al. 1991). These deposits represent sediment eroded from the uplifting Sierra Nevada. California's Pleistocene sedimentary units—especially those that, like the Modesto and Riverbank Formations, record deposition in continental settings—are typically considered highly sensitive for paleontological resources because of the large number of recorded fossil finds in such units throughout the state.

3.8.2 Regulatory Framework

This section describes laws and regulations at the state and local level that may apply to the proposed project. There are no federal regulations that apply to the project.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was adopted in 1972 and is designed to restrict certain development along active faults. The Act requires that the State Geologist delineate earthquake fault zones around the surface traces of active faults and to maintain maps outlining these zones. Active faults are defined as faults that have been active within the last 11,000 years. The purpose of these zones is to prevent the construction of buildings used for human occupancy within an earthquake fault zone. In addition to delineating earthquake fault zones, the Act requires disclosure of properties located within an earthquake fault zone when buying or selling a property. The Act was first designated as the Alquist-Priolo Geologic Hazard Zones Act but was later changed to the Alquist-Priolo Special Studies Zones Act in 1975 and changed again in 1994 to the Alquist-Priolo Earthquake Fault Zoning Act (CGS 2007). The proposed project is not located within a Fault-Rupture Hazard Zone designated by the Alquist-Priolo Earthquake Fault Zoning Act of 1972 and Special Publication 42.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act and related regulations establish a statewide minimum public safety standard for mitigation of earthquake hazards. According to this act, the minimum level of mitigation should reduce the risk of ground failure during an earthquake to a level that does not cause the collapse of buildings for human occupancy, but, in most cases, not to a level of no ground failure at all. Nothing in the act precludes public agencies from enacting more stringent requirements, or from requiring a higher level of performance.

California Building Code

The California Building Code (CBC), which is codified in California Code of Regulations (CCR) Title 24, Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards related to structural strength, egress facilities, and general building stability. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all building and structures within its jurisdiction. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable.

The CBC is based on the International Building Code. The 2007 CBC is based on the 2006 International Building Code published by the International Code Conference. In addition, the CBC contains necessary California amendments that are based on the American Society of Civil Engineers (ASCE) Minimum Design Standards 7-05. ASCE 7-05 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (flood, snow, wind, etc.) for inclusion in building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients, all of which are used to determine a Seismic Design Category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E/F (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the SDC. Compliance with the CBC would be necessary for structures at the new pumping plant and possibly for certain grading activities on the project site.

California Department of Water Resources Division of Safety of Dams (DSOD)

DSOD reviews plans and specifications for the construction of new dams or for the enlargement, alteration, repair, or removal of existing dams. DSOD must grant written approval before construction can proceed on any dam under DSOD jurisdiction. Dams under the jurisdiction of DSOD are defined in the California Water Code (Division 3, Dams and Reservoirs; Part 1, Supervision of Dams and Reservoirs; Chapter 1, Definitions).

The proposed dam would be subject to DSOD jurisdiction. A construction application, combined with plans, specifications and other requirements would be filed with DSOD. For engineering analysis, DSOD requires a deterministic seismic hazard analysis, which yields estimates of the level of ground shaking due to an earthquake occurring on identified faults. The dam would be designed to withstand groundshaking as determined by the seismic hazard analysis. *Section 2.4.4* in *Chapter 2, Project Description*, details applicable design criteria for construction of the dam to meet DSOD requirements. The engagement and interactions between the Project Partners and DSOD follow a prescribed, structured regulatory process. DSOD would only approve the application after all dam safety related issues are resolved.

California Public Resources Code

Several sections of the California Public Resources Code protect paleontological resources. Section 5097.5 prohibits “knowing and willful” excavation, removal, destruction, injury, and defacement of any paleontological feature on public lands (lands under state, county, city, district, or public authority jurisdiction, or the jurisdiction of a public corporation), except where the agency with jurisdiction has granted express permission. Section 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands.

Stanislaus County General Plan

The Stanislaus County General Plan guides development for the County with a 20-year planning horizon. The following policies outlined in the Agricultural and Safety elements of the County’s General Plan would apply to the project.

The Safety Element of the County’s general plan has two goals related to geologic and seismic hazards. Each is supported by policies and implementation measures.

GOAL ONE. Prevent loss of life and reduce property damage as a result of natural disasters.

POLICY THREE. Development should not be allowed in areas that are particularly susceptible to seismic hazard.

Implementation Measures

1. The County shall enforce the Alquist-Priolo Earthquake Fault Zoning Act.
2. Development in areas of geologic hazard shall be considered for approval only where the development includes an acceptable evacuation route.
3. Development proposals adjacent to reservoirs shall include evaluations of the potential impacts from a seismically induced seiche.
4. The routes of new public roads in areas subject to significant seismic hazard shall be designed to minimize seismic risk.
5. Where it is found that right-of-way widths greater than those specified in the Circulation Element are necessary to provide added safety in geologically unstable areas, additional width shall be required.

POLICY FOUR. Development west of I-5 in areas susceptible to landslides (as identified in this element) shall be permitted only when a geological report is presented with (a) documented evidence that no such potential exists on the site, or (b) identifying the extent of the problem and the mitigation measures necessary to correct the identified problem.

Implementation Measures

1. The County shall utilize the California Environmental Quality Act (CEQA) process to ensure that development does not occur that would be especially susceptible to landslide. Most discretionary projects require review for compliance with CEQA. As part of this review, potential impacts must be identified and mitigated or a statement of overriding concerns adopted.
2. Development west of I-5 shall include a geological report unless the Chief Building Official and Planning Director are satisfied that no need for the study is present.
3. The routes of new public roads in areas subject to landslides shall be designed to minimize landslide risks.

   POLICY FIVE. Stanislaus County shall support efforts to identify and rehabilitate structures that are not earthquake resistant.

Implementation Measures

1. The County shall take advantage of programs that would provide funds to identify and rehabilitate structures that do not currently meet building standard minimums for earthquake resistance.

GOAL TWO. Minimize the effects of hazardous conditions that might cause loss of life and property.

POLICY FOURTEEN. The County will continue to enforce state-mandated structural Health and Safety Codes, including but not limited to the Uniform Building Code, the Uniform Housing Code, the Uniform Fire Code, the Uniform Plumbing Code, the National Electric Code, and Title 24. (Comment: The Uniform Building Code includes provisions for safe construction under the most current standards. The Uniform Housing Code provides for upgrading of existing dwellings to eliminate health and safety problems without requiring upgrading of non-hazardous conditions.)

Implementation Measures

1. All building permits shall be reviewed to ensure compliance with the Uniform Building Code.
2. All complaints of substandard dwellings shall be acted upon to ensure compliance with the Uniform Housing Code.
3. The Uniform Fire Code shall be followed in inspections and maintenance of structures regulated under that code.

The Conservation Element of the County's general plan has one policy and various implementation measures related to geologic and seismic hazards.

GOAL FIVE. Reserve, as open space, lands subject to natural disaster in order to minimize loss of life and property of residents of Stanislaus County.

POLICY SIXTEEN. Discourage development on lands that are subject to flooding, landslide, faulting or any natural disaster to minimize loss of life and property.

Implementation Measures

1. Enforce the provisions of the Alquist-Priolo Earthquake Fault Zoning Act.
2. Development will not be permitted in floodways unless it meets the requirements of Chapter 16.40 of the County Code and is approved by the State Reclamation Board.
3. Development proposals in an area identified as having unstable soils (bluff, landslide areas in the foothills, etc.) shall include measures for mitigating possible hazards.

4. The County shall enforce the subdivision ordinance requirement for soils reports, which may be required to include a geologic report.
5. The County shall utilize the California Environmental Quality Act (CEQA) process to ensure that development does not occur that would be subject to natural disasters.

The Conservation Element of the Stanislaus County General Plan addresses paleontological resources.

GOAL EIGHT. Preserve areas of national, state, regional, and local historical importance.

POLICY TWENTY-FOUR. The County will support the preservation of Stanislaus County's cultural legacy of archeological, historical, and paleontological resources for future generations.

Implementation Measure. The County shall utilize the California Environmental Quality Act (CEQA) process to protect archaeological, historic, or paleontological resources. Most discretionary projects require review for compliance with CEQA. As part of this review, potential impacts must be identified and mitigated.

3.8.3 Impact Analysis

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to geology and soils. The analysis is based on a review of geologic maps and reports, including geologic and geotechnical reports and information from state and local agencies.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines,* as updated in December 2018 an impact related to geology and soils would be considered significant if the project would:

- Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.
  - Strong seismic ground shaking.
  - Seismic-related ground failure, including liquefaction.
  - Landslides.
- Result in substantial soil erosion or the loss of topsoil.
- 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.
- 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.
- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.
- Directly or indirectly destroy a unique paleontological resources or site or unique geologic feature.

Criteria Requiring No Further Evaluation

The Initial Study determined that the project would not have significant impacts associated with the following criteria:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving the 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.

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

Impacts and Mitigation Measures

Impact GEO-1 Substantial adverse effects due to strong seismic ground shaking, seismic-related ground failure, including liquefaction, and landslides

Construction and Operation Impacts

Most structures, including buildings, dams, and pipelines, are subject to damage from earthquakes. The intensity of such an event would depend on which fault the earthquake occurs, the distance of the epicenter from the project site and the duration of shaking. While the proposed project is not located within a Fault-Rupture Hazard Zone designated by the Alquist-Priolo Earthquake Fault Zoning Act of 1972 and Special Publication 42, there are two active faults within 20 miles of the study area.

The project area would likely experience strong ground shaking in the future. The most severe loadings a dam usually experiences are due to earthquake induced ground shaking. Strong ground shaking can result in damage and instability of the dam embankment, strength loss of the foundation, instability of the natural reservoir rim, and reservoir overtopping the dam caused by a seiche. No active faults are mapped within the project area. The Great Valley/Orestimba fault is mapped immediately east of the dam (see Appendix E). Strong ground shaking and potential surface fault rupture/tectonic deformation associated with the Coast Ranges-Sierran Block (CRSB) boundary zone or nearby faults may impact the proposed project. (**Figure 3.8-2**). **Table 3.8-1** includes the potential fault sources near the proposed Project.

As noted in *Section 2.4.4* of the *Project Description*, the project would be designed to meet all DSOD requirements. Specific recommendations and considerations that shall be addressed include but are not limited to measures to ensure foundation stability, management of seepage, adequate capacity of the spillway and outlet works, and rim stability. The main dam and saddle dam and all associated structures would be designed to remain stable during an earthquake.

Potential hazards could result from secondary ground failure (i.e., seismically induced settlement) associated with the expected level of seismic ground shaking, landslides, and subsidence. These hazards could result from either local geologic conditions or project construction and operations. The dam foundation would be founded upon bedrock and is not susceptible to liquefaction. The conveyance facilities are sited on dense sandy and gravelly material above the groundwater table and are thus also not susceptible to liquefaction. With implementation of Mitigation Measure GEO-1, seismic-related impacts would be reduced to a less-than-significant level.

The project area may also experience landslides, particularly near areas of the proposed road alignment and reservoir inundation areas. This is further discussed in Impact GEO-3.

Significance before Mitigation

The risk of substantial adverse effects due to strong seismic ground shaking, seismic-related ground failure and landslides is potentially significant before mitigation.

Mitigation Measures

Mitigation Measure GEO-1: Perform Design-Level Geotechnical Evaluations for Seismic Hazards

During the design phase for the proposed project, the Project Partners shall prepare a design level Geotechnical Investigation and Report. The Geotechnical Investigation and Report shall further investigate and evaluate subsurface conditions, potential geohazards, and provide further project – specific information for development of excavation and construction plans and procedures. The geotechnical evaluations shall include appropriate site-specific geotechnical investigations including those focused on the geologic units and soils of the project area that could become unstable as a result of the project and shall be based on the site conditions, location, and professional opinion of the geotechnical engineer. Investigations may include subsurface drilling, soil testing, and analysis of site seismic response to determine appropriate and feasible measures to be incorporated into the project design. A geotechnical interpretive report shall be prepared to detail the findings of the evaluations. The performance standard to be used in the geotechnical evaluations will be minimization of the hazards associated with seismic ground shaking, landslides, and subsidence. If the results of the geotechnical investigations indicate the presence of hazards, appropriate support and protection measures shall be designed and implemented.

Potential landslide mitigation measures that could be considered include avoidance of the feature, or reduction of vulnerability to the project through engineering design. Engineered mitigation options may include subddrains, dewatering, and/or systems to prevent surface water infiltration, and/or design of appropriate stabilization approaches to reduce driving forces and/or increase resisting forces, including retaining walls and mechanically stabilized embankments. Monitoring of the hazardous features including performance of any mitigation option will be included as part of the long-term operation and maintenance of the proposed project.

Recommendations provided in the Geotechnical Investigation and Report shall be incorporated into the final construction plans and specifications and shall augment the design and construction requirements of the California Department of Water Resources Division of Safety of Dams (DSOD) dam safety guidelines. Design of the project shall comply with all measures required by DSOD.

Significance after Mitigation

Through the implementation of Mitigation Measure GEO-1, the design of the proposed project components would use detailed and site-specific data to ensure that final design and specifications of facilities would adequately address the risks associated with strong seismic groundshaking, ground failure including liquefaction, and landslides. Therefore, impacts would be less than significant with mitigation measures incorporated.

Impact GEO-2 Substantial soil erosion or loss of topsoil

Construction Impacts

The proposed project includes one primary dam, three saddle dams, conveyance facilities, and electrical facilities, and includes the relocation of Del Puerto Canyon Road and the existing utility corridors. In total, 1,642.2 acres of land would be disturbed or inundated with by water behind the dams. Construction activities would require excavation, soil relocation, grading, trenching, and other activities that would result in the temporary disturbance of soil and would expose disturbed areas to storm events. Rain of sufficient intensity and duration could dislodge soil particles, generate runoff, and cause localized erosion. Soil disturbance during the summer months could result in loss of topsoil because of wind erosion and thunderstorm events. Heavy equipment traffic in the project sites could result in soil compaction which would reduce the water holding capacity of the soil, increasing the potential for runoff and erosion. Because the project would disturb more than 1 acre of land during construction, coverage under the State of California General Construction Storm Water Permit (Construction General Permit, Order No. 2009-0009-DWQ as modified by Order No. 2010-0014-DWQ and 2012-0006-DWQ) would be required.

Because the proposed project could result in substantial soil erosion or loss of topsoil, this impact would be potentially significant.

Operational Impacts

Operation of the proposed project would not include scheduled or regular disturbance of soil. Dam faces would be designed to minimize the risk of erosion to maintain structural integrity. Other proposed project facilities, such as the pump facilities and electrical components, would be designed using BMPs to reduce the risk of erosion. Operational impacts are therefore less than significant.

Significance before Mitigation

The risk of substantial adverse effects due to soil erosion or loss of topsoil is potentially significant before mitigation.

Mitigation Measures

Mitigation Measure GEO-2: Prepare and implement a SWPPP and associated BMPs

Before any ground-disturbing activities begin, the Project Partners shall prepare a Project Specific SWPPP that will be implemented as part of the Construction General Permitting Process. The contractor hired by the Project Partners to implement the SWPPP shall review and certify they will implement the BMPS identified on the SWPPP, including an erosion control plan, and measures to eliminate construction waste measures to ensure that waters of the United States and the state are protected. The SWPPP shall include site design measures to minimize off-site stormwater runoff that might otherwise affect surrounding habitats. The Central Valley Regional Water Quality Control Board will review and monitor the effectiveness of the SWPPP through mandatory reporting by the Project Partners and the construction contractor as required.

The SWPPP shall be prepared with the following objectives:

- Identify all pollutant sources, including sources of sediment, that may affect the quality of stormwater discharges from construction of the project.
- Identify BMPs that effectively reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the site during construction to the Best Available Technology/Best Control Technology standard.
- Provide calculations and design details as well as BMP controls for site run-on that are complete and correct.
- Identify project discharge points and receiving waters.
- Provide stabilization BMPs to reduce or eliminate pollutants following construction.

The construction contractor shall implement the SWPPP, including all BMPs, and shall inspect all BMPs during construction. Potential SWPPP BMPs could include but would not be limited to the following:

- Preserve existing vegetation where possible.
- Roughen the surfaces of final grades to prevent erosion, decrease runoff, increase infiltration, and aid in vegetation establishment.
- Place riparian buffers or filter strips along the perimeter of the disturbed area to intercept pollutants before off-site discharge.
- Place fiber rolls around on-site drain inlets to prevent sediment and construction related debris from entering inlets.
- Place fiber rolls along down-gradient disturbed areas of the site to reduce runoff flow velocities and prevent sediment from leaving the site.
- Place silt fences down-gradient of disturbed areas to slow down runoff and retain sediment.
- Stabilize the construction entrance to reduce the tracking of mud and dirt onto public roads by construction vehicles.

- Stage excavated and stored construction materials and soil stockpiles in stable areas and cover or stabilize materials to prevent erosion.
- Stabilize temporary construction entrances to limit transport/introduction of invasive species and control fugitive dust emissions.

Significance after Mitigation

Through the implementation of Mitigation Measure GEO-2, the construction of the proposed project components would comply with the site specific and approved SWPPP to reduce the risk and impact associated with soil erosion and loss of topsoil. Therefore, impacts would be less than significant with mitigation measures incorporated.

Impact GEO-3 Location of the proposed project 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

Construction and Operation Impacts

As described in Section 3.8.1 above, the proposed project facilities lie in an area susceptible to seismic activity, landslides, lateral spreading, subsidence, and collapse. At least seven landslides are mapped within the inundation area of the proposed reservoir. It is expected that additional small landslides and movement of existing landslides would occur as a result of reservoir infilling and operations. These landslides would be expected to experience continuous deformation without some form of stabilization/mitigation. The rate of movement of landslides would likely be slow but would have the potential to impact the road alignment. Design of the road alignment and reservoir rim would focus on increasing stability and reducing the impact of seismically triggered landslides to reasonably decrease disruptions and damage to the roadway.

The dam foundation would be founded upon bedrock and is not susceptible to liquefaction. The conveyance system (pipeline and pump station) would be founded on dense sandy and gravelly material above the groundwater table and is thus not susceptible to liquefaction.

Significance before Mitigation

The risk of substantial adverse effects due to the proposed project location on a geologic unit or soil that is unstable or potentially unstable is potentially significant before mitigation.

Mitigation Measures

Refer to **Mitigation Measure GEO-1: Perform Design-Level Geotechnical Evaluations for Seismic Hazards**

Significance after Mitigation

Through the implementation of Mitigation Measure GEO-1, the design of the proposed project components would use the design and construction measures from the Geotechnical Investigation and Report to mitigate potential on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse from geologic units or soils that are unstable or could become unstable due to the proposed project. Therefore, impacts would be less than significant with mitigation measures incorporated.

Impact GEO-4 Location of the proposed project on expansive soil creating substantial direct or indirect risk to life or property

Construction and Operation Impacts

There is limited potential for expansive soils in the project area, and expansive soils are not expected to adversely affect the proposed project. Expansive soils would be considered during the design of the proposed project.

<u>Significance before Mitigation</u>

The risk of substantial adverse effects due to the proposed project location on expansive soil creating substantial direct or indirect risk of life or property is minimal but is considered potentially significant before mitigation.

<u>Mitigation Measures</u>

Mitigation Measure GEO-3: Site-specific geotechnical investigation for soil expansion

The design-level geotechnical evaluation shall consider the potential for expansive soils and include measures that would ensure that structures are not damaged by expanding and contracting soils. Feasible measures would include removal and replacement of soil, deep foundations, or deep mixing of compressible or expansive soils with stabilizing agents. All measures included in the geotechnical evaluation shall be incorporated into project design specifications.

<u>Significance after Mitigation</u>

Through the implementation of Mitigation Measure GEO-4, the design of the proposed project components would address direct or indirect risks to life or property due to expansive soils and ensure that structures are designed to avoid damage from soil expansion and contraction. Therefore, impacts would be less than significant with mitigation measures incorporated.

Impact GEO-5 Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Construction and Operation Impacts

The proposed project including both project facilities and the inundation area has the potential to disturb approximately 1,640 acres. Many of the geologic units in the proposed project site are highly sensitive for paleontological resources. If fossils are present where development is planned, they could be damaged by earth-disturbing activities during construction, such as excavation for foundations, placement of fills, trenching for utility systems, and grading for roads and staging areas. The more extensive and deeper the earth-disturbing activity, the greater the potential for damage to paleontological resources.

<u>Significance before Mitigation</u>

The proposed project site includes the construction of several facilities requiring earth-disturbing activities such as trenching and the installation of pipelines and dams. Due to these potential activities, the risk of directly or indirectly destroying unique paleontological resources, sites, or unique geologic features is significant before mitigation.

<u>Mitigation Measures</u>

Mitigation Measure GEO-4: Preparation and implementation of a Paleontological Resources monitoring and protection plan

A Paleontological Resources, Monitoring, and Protection Plan (Paleontological Plan) shall be prepared for the proposed project by a paleontologist or similar professional. The Paleontological Plan shall include BMPs to be followed by the contractor during construction of the proposed project. The Paleontological Plan may include, but is not limited to:

- Processes and requirements for the observation of grading and earth disturbing activities to watch for fossils or other paleontological resources including identification of those construction activities/components of the proposed project that might require monitoring.
- A process to follow if paleontological resources are discovered, including:
    - Stop all work and salvage unearthed fossil remains including simple excavation of exposed specimens or, if necessary, plaster-jacketing of large and/or fragile specimens, or richly fossiliferous deposits.

- Record stratigraphic and geologic data to provide a context for the recovered fossil remains, typically including a detailed description of all paleontological localities within the project site, as well as the lithology of fossil-bearing strata within the measured stratigraphic section, if feasible, and photographic documentation of the geologic setting.
- Prepare collected fossil remains for curation, to include cleaning the fossils by removing the enclosing rock material, stabilizing fragile specimens using glues and other hardeners, if necessary, and repairing broken specimens.
- Curate, catalog and identify the fossil remains to the lowest taxon possible, inventory specimens, assign catalog numbers, and enter the appropriate specimen and locality data into a collection database.
- Transfer the cataloged fossil remains to an accredited institution (museum or university) in California that maintains paleontological collections for archival storage and/or display. The transfer shall include copies of relevant field notes, maps, stratigraphic sections, and photographs.
- Prepare a Paleontological Resources Mitigation Report summarizing the field and laboratory methods used, the stratigraphic units inspected, the types of fossils recovered, and the significance of the fossils collected, and provide this report to the Project Partners, Stanislaus County, and appropriate paleontological programs/institutions near the proposed project site such as the University of California (Berkeley) Museum of Paleontology or the Natural History Museum of Los Angeles County.

The Paleontological Plan shall be reviewed and implemented by the Project Partners and the contractor.

Significance after Mitigation

Through the implementation of Mitigation Measure GEO-5, the Projects Partners and the contractor would implement the Paleontological Plan to mitigate the significant impacts to paleontological resources. Preservation and recordation of paleontological resources would reduce impacts to less than significant.

Cumulative Impact Analysis

The geographic scope of the cumulative impacts on Geology and Soil resources encompasses the study area and surrounding areas. If the proposed project, as well as other projects listed in **Table 3.0-1**, would adversely affect the same geologic, soil, or paleontological resources, they could result in significant cumulative impacts on geology and soils of the area. Impacts to these resources are generally site-specific and it is not expected that the proposed project and other cumulative projects would combine to result in cumulative increase in geologic hazards.

Significance Determination

Because the proposed project is not expected to combine with other projects to result in a cumulative increase in geologic hazards, impacts would be less than significant.

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3.9 Greenhouse Gas Emissions

This section evaluates greenhouse gas (GHG) emissions associated with implementation of the proposed project. This analysis is based on a review of GHG inventories, climate change policies and regulations, and information from state and local agencies; this analysis includes an estimation of the proposed project GHG emissions.

3.9.1 Environmental Setting

The discussion describes the existing environmental conditions within the study area, which includes the project site, the San Joaquin Valley Air Basin where the project is located, and the state of California where the applicable thresholds of significance have been established.

Study Area

Climate change is a global issue and planning surrounding it has been conducted at the state level. Accordingly, the study area for the purposes of GHG emissions considers global GHG emissions in the context of statewide GHG emissions reduction targets that will allow for California to do its share in reducing GHG emissions globally.

Global Climate Change

Global warming and global climate change are terms that describe changes in the Earth's climate. Global climate change is a broader term, used to describe any worldwide, long-term change in the Earth's climate. This change could be, for example, an increase or decrease in temperatures, the start or end of an ice age, or a shift in precipitation patterns. The term global warming is more specific and refers to a general increase in temperatures across the Earth. Although global warming is characterized by rising temperatures, it can cause other climatic changes, such as a shift in the frequency and intensity of rainfall or hurricanes. Global warming does not necessarily imply that all locations will be warmer. Some specific, unique locations may be cooler even though the Earth, on average, is warmer. All of these changes fit under the umbrella of global climate change.

Because GHGs persist and mix in the atmosphere, they have impacts on a global scale, rather than locally or regionally like most air pollutants. Consequently, GHG emissions that contribute to global climate change result in a worldwide cumulative impact (global warming) rather than a local or regional project-specific impact typically associated with criteria pollutants. Impacts related to GHG emissions are discussed in the context of the proposed project's contribution to statewide and global GHG emissions. Although natural processes can cause global warming, general scientific consensus is that present-day global warming is the result of human activity on the planet (IPCC 2007, 2014). This human-made, or anthropogenic, warming is caused primarily by increased GHG emissions, which keep the Earth's surface warm, known as "the greenhouse effect." The greenhouse effect and the role GHG emissions play in it are described below.

The Greenhouse Effect and Climate Change Impacts

The Earth's atmosphere functions like a greenhouse, allowing sunlight in and trapping some of the heat that reaches the Earth's surface. When solar radiation from the sun enters the Earth's atmosphere, a small portion is reflected back toward space, although a majority of it is absorbed by the Earth's surface. The solar radiation that is absorbed by the Earth's surface then is re-emitted as heat in the form of low-frequency infrared radiation. Although GHGs in the atmosphere do not absorb solar radiation, they do absorb the lower frequency infrared radiation, thereby trapping it within the Earth's atmosphere and resulting in the warming of the Earth's surface.

The Earth's greenhouse effect has existed far longer than humans have, and it has played a key role in the development of life. Concentrations of major GHGs (discussed in further detail under Greenhouse Gases and their Emissions below) such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and water vapor (H_2O) have been naturally present for millennia at relatively stable levels in the atmosphere, adequate to keep temperatures on the Earth hospitable. Without these GHGs, the Earth's temperature would be too cold for life to exist. However, as human industrial activity has increased, atmospheric concentrations of certain GHGs have grown dramatically. Anthropogenic sources are responsible for GHG emissions in excess of naturally occurring concentrations, thereby intensifying the greenhouse effect and resulting in global climate change.

The Intergovernmental Panel on Climate Change's (IPCC) Fifth Assessment Report: Climate Change 2014 stated that human influence on the climate system is clear, and recent anthropogenic (human-induced) emissions of greenhouse gases are the highest in history (IPCC 2014). In addition, the report stated that recent climate changes have had widespread impacts on human and natural systems. Confidence levels of claims in this report have increased since 2001, because of the large number of simulations run and the broad range of available climate models.

Global climate change is particularly important when discussing water infrastructure and supply. According to the Fifth Assessment Report (IPCC 2014), in many regions, changing precipitation or melting snow and ice are altering hydrological systems, affecting quantity and quality of water resources. Thus, it is important that water infrastructure and supply is adapted to meet these climate change impacts.

Greenhouse Gases

Pollutants that are known to increase the greenhouse effect in the earth's atmosphere, thereby adding to global climate change impacts, are referred to as greenhouse gases or GHGs. A number of pollutants have been identified as GHGs. The State of California definition of GHGs in the Health & Safety Code, Section 38505(g) includes carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Some greenhouse gases, such as carbon dioxide, occur naturally and are emitted to the atmosphere through natural processes. Other GHGs (e.g., fluorinated gases) are created and emitted solely through human activities. The most common GHGs that result from human activity are carbon dioxide, followed by methane and nitrous oxide. Common GHG are discussed below:

- Carbon Dioxide (CO_2): Carbon dioxide enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.
- Methane (CH_4): Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- Nitrous Oxide (NO_2): Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- Fluorinated Gases: Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances (i.e., CFCs, HCFCs, and halons). Fluorinated gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes referred to as high global warming potential gases (high GWP gases).
    - Hydrofluorocarbons are manmade chemicals that have historically replaced chlorofluorocarbons used in refrigeration and semi-conductor manufacturing.
    - Perfluorocarbons are manmade chemicals that are by-products of aluminum smelting and uranium enrichment.

- Sulfur hexafluoride is a manmade chemical, largely used in heavy industry to insulate high voltage equipment and to assist in the manufacturing of cable cooling systems.

The Global Warming Potential (GWP) was developed to allow comparisons of global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide (CO_2). The larger the GWP, the more that a given gas warms the Earth compared to CO_2 over that time period. The time period usually used for GWPs is 100 years. GWPs provide a common unit of measure, which allows analysts to add up emissions estimates of different gases (e.g., to compile a national GHG inventory), and allows policymakers to compare emissions reduction opportunities across sectors and gases.

- CO_2, by definition, has a GWP of 1 regardless of the time period used, because it is the gas being used as the reference. CO_2 remains in the climate system for a very long time: CO_2 emissions cause increases in atmospheric concentrations of CO_2 that will last thousands of years.
- Methane (CH_4) is estimated to have a GWP of 28–36 over 100 years. CH_4 emitted today lasts about a decade on average, which is much less time than CO_2. But CH_4 also absorbs much more energy than CO_2. The net effect of the shorter lifetime and higher energy absorption is reflected in the GWP. The CH_4 GWP also accounts for some indirect effects, such as the fact that CH_4 is a precursor to ozone, and ozone is itself a GHG.
- Nitrous Oxide (N_2O) has a GWP 265–298 times that of CO_2 for a 100-year timescale. N_2O emitted today remains in the atmosphere for more than 100 years, on average.
- Chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), hydrochlorofluorocarbons (HCFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) are sometimes called high-GWP gases because, for a given amount of mass, they trap substantially more heat than CO_2. (The GWPs for these gases can be in the thousands or tens of thousands.)

The most important GHG in human-induced global warming is CO_2. Although many gases have much higher GWPs than the naturally occurring GHGs, CO_2 is emitted in such vastly higher quantities that it accounted for 81 percent of all GHGs emitted in the U.S. in 2014 (EPA 2017). Fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles, has led to substantial increases in CO_2 emissions over time and, thus, substantial increases in atmospheric CO_2 concentrations. In 2005, atmospheric CO_2 concentrations were about 379 ppm, over 35 percent higher than the pre-industrial concentrations of about 280 ppm (IPCC 2007). In addition to the sheer increase in the volume of its emissions, CO_2 is a major factor in human-induced global warming because of its long lifespan in the atmosphere of 50 to 200 years.

Carbon dioxide equivalent (CO_2e) is a metric measure used to compare the emissions from various greenhouse gases based on their GWP compared to CO_2. The CO_2e for a gas is derived by multiplying the tons of the gas by the associated GWP. For example, using a GWP of 25 for methane, 1 ton of methane is equal to 25 tons of CO_2e.

California Climate Impacts

According to the most recent Climate Change Scoping Plan (CARB 2017), California is already feeling the effects of climate change. The following changes are already occurring:

- An increase in annual average temperatures, as well as increases in daily maximum and minimum temperatures.
- An increase in the occurrence of extreme events, including wildfire and heat waves.
- A reduction in spring runoff volumes, as a result of declining snowpack.
- A decrease in winter chill hours, necessary for the production of high-value fruit and nut crops.
- Changes in the timing and location of species sightings.

In addition, the Climate Change Scoping Plan (CARB 2017) states that extreme drought conditions are more likely to occur under a changing climate, which highlights the need for developing drought resilience. California's recent drought incited land subsidence, pest invasions that killed over 100 million forest trees in the Sierra Nevada, and water shortages throughout the State. Drought affects other sectors as well. An analysis of the amount of water consumed in meeting California's energy needs between 1990 and 2012 shows that while California's energy policies have supported climate mitigation efforts, the performance of these policies have increased vulnerability to climate impacts, especially greater hydrologic uncertainty.

California GHG Emissions Inventory

The annual statewide GHG emission inventory for 2017 (CARB 2019) shows that statewide emissions were 424 million metric tons CO_2e, 5 $MMTCO_2e$ lower than 2016 levels and 7 $MMTCO_2e$ below 1990 levels and the 2020 GHG reduction target of 431 $MMTCO_2e$. 2017 emissions have decreased by 14 percent since peak levels in 2004. Per capita GHG emissions in California have dropped from a 2001 peak of 14.1 tonnes per person to 10.7 tonnes per person in 2017, a 24 percent decrease.

In the 2017 emissions inventory, the transportation sector remained the largest source of GHG emissions in the state, but saw a one percent increase in emissions in 2017, the lowest growth rate over the past four years. Emissions from the electricity sector account for 15 percent of the inventory and show another large drop in 2017 due to a large increase in renewable energy. For the first time since California started to track GHG emissions, California uses more electricity from zero-GHG sources (for the purpose of the GHG inventory, these include hydro, solar, wind, and nuclear energy) than from GHG-emitting sources for both in-state generation and total (in-state plus imports) generation in 2017. The industrial sector has seen a slight emissions decrease in the past few years and remains at 21 percent of the inventory. Emissions from high-GWP gases have continued to increase as they replace ozone depleting substances banned under the 1987 Montreal Protocol. Emissions from other sectors have remained relatively constant in recent years.

Climate Change Adaptation

As mentioned above, climate change is already affecting natural and human systems across the globe. California addresses adaptation to climate change through its California Climate Adaptation Strategy (California Natural Resources Agency 2009). Adopted in 2009, the strategy summarizes climate change impacts and recommends adaptation strategies across seven sectors: Public Health, Biodiversity and Habitat, Oceans and Coastal Resources, Water, Agriculture, Forestry, and Transportation and Energy. The California Climate Adaptation Strategy for Water recognizes that climate change is expected to result in changes in snowpack, sea level, and river flows; more precipitation will fall as rain instead of snow; flood risks will be exacerbated; and water supply reliability will become more challenging. Some examples of climate change adaption for California's water sector include:

- Aggressively Increase Water Use Efficiency: implement strategies to achieve a statewide 20 percent reduction in per capita water use by 2020; apply all feasible Efficient Water Management practices to agricultural entities; implement recycled water; promote mainstream adoption of aggressive water conservation by urban and agricultural water systems and their users.
- Practice and Promote Integrated Flood Management: integrate flood management with watershed management; develop flood protection and emergency preparedness plans; implement land use policies that decrease flood risk.
- Expand Water Storage and Conjunctive Management of Surface and Groundwater Resources: expand available water storage for both surface and groundwater supplies; incorporate climate change considerations into storage feasibility studies; develop conjunctive use plans that integrate floodplain management, groundwater banking, and surface storage.

- Plan for and Adapt to Sea Level Rise: establish a range of sea level rise projections and incorporate them into water plans.

3.9.2 Regulatory Framework

This section describes laws and regulations at the federal, State, regional, and local level that apply to the project.

Federal Policies and Regulations

US Supreme Court and Endangerment Ruling

The U.S. Supreme Court ruled in 2007 that GHG emissions are air pollutants, covered under the Clean Air Act, in *Massachusetts v. The Environmental Protection Agency*. The Court found that the US EPA has a mandatory duty to enact rules regulating mobile GHG emissions pursuant to the federal Clean Air Act. The Court held that GHGs fit the definition of an air pollutant causing and contributing to air pollution, which reasonably may be anticipated to endanger public health or welfare. In 2009, the EPA Administrator determined that existing and projected concentrations of GHGs threaten public health and welfare of present-day and future generations, and that combined emissions from motor vehicles contribute to GHG pollution. EPA's endangerment finding covers emissions of six GHGs: CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6.

Corporate Average Fuel Economy Standards

The Corporate Average Fuel Economy standards were first enacted by Congress in 1975, requiring vehicle manufacturers to comply with the gas mileage or fuel economy standards. These standards are set and regulated by the National Highway Traffic Safety Administration, with testing and data support from EPA. The issued rules include fuel economy standards for light-, medium- and heavy-duty vehicles. More fuel-efficient vehicles result in lower emissions of GHG.

For light-duty vehicles, National Highway Traffic Safety Administration and EPA issued a joint final rulemaking on October 15, 2012, to establish coordinated standards to improve fuel economy and reduce greenhouse gas emissions for vehicle model years 2017 and beyond (77 FR 62624). EPA established standards that are projected to require, on an average industry fleet wide basis, 54.5 miles per gallon; the National Highway Traffic Safety Administration standards are projected to require, on an average industry fleet wide basis, a range from 40.3-41.0 miles per gallon. For medium- and heavy-duty vehicles, EPA and National Highway Traffic Safety Administration issued a final rule on December 27, 2016 on greenhouse gas emissions standards and fuel consumption standards for engines and vehicles model years 2018 through 2029 (81 FR 73478).

GHG in NEPA Documents

On February 18, 2010, the Council on Environmental Quality (CEQ) released draft guidance on the consideration of GHGs in NEPA documents for federal actions. Revised draft guidance was released in 2014. The draft guidelines included a presumptive threshold of 25,000 metric tons of CO_2e emissions from a proposed action to trigger a quantitative analysis. CEQ had ~~s~~ not established when GHG emissions are "significant" for NEPA purposes, but rather posed ~~s~~ that question to the public (CEQ 2014). The 2010 CEQ GHG guidance was rescinded in March 2017 with EO 13783 titled "Promoting Energy Independence and Economic Growth." In June 2019, CEQ published draft guidance on how NEPA analysis and documentation should address GHG emissions. The 2019 draft guidance recommends agencies quantify a proposed action's GHG emission when possible; place the proposed action's GHG emissions into the context of local, regional, national, or sector-wide emissions inventories, if available; and provide a qualitative summary discussion of the effects of GHG emissions (CEQ 2019).

State Policies and Regulations

California Environmental Protection Agency

The California Environmental Protection Agency (Cal-EPA) is a state agency that includes CARB, the State Water Resources Control Board, nine Regional Water Quality Control Boards, the Integrated Waste Management Board, the Department of Toxic Substances Control, the Office of Environmental Health Hazard Assessment, and the Department of Pesticide Regulation. The mission of Cal-EPA is to restore, protect, and enhance the environment and to ensure public health, environmental quality, and economic vitality. Several state agencies cooperate in the development of a climate action plan. The Secretary of Cal-EPA leads the Climate Action Team, whose goal is to implement global warming emission reduction programs identified in the Climate Action Plan and to report on the progress made toward meeting the emission reduction targets established in the executive order.

California Advanced Clean Cars Program

AB 1493 (2002) required CARB to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards, referred to as "Pavley" standards, apply to automobiles and light trucks beginning with the 2009 model year. Litigation was filed by automakers, challenging these regulations. EPA initially denied California's related request for a waiver to allow California to regulate vehicle emissions beyond EPA requirements, but a waiver subsequently was granted. Pavley I regulates model years from 2009 to 2016 and Pavley II, which is now referred to as "LEV (Low Emission Vehicle) III GHG," regulates model years from 2017 to 2025. The Advanced Clean Cars program coordinates the goals of the Low Emissions Vehicles (LEV), Zero Emissions Vehicles (ZEV), and Clean Fuels Outlet programs. The Advanced Clean Cars Program would lower GHG emissions from new automobiles by 40 percent compared to 2012 model years by 2025 (CARB 2019).

California Global Warming Solutions Act

CARB is the lead agency for implementing AB 32, the California Global Warming Solutions Act, adopted by the State Legislature in 2006. AB 32 codified a statewide target set under Executive Order (EO) S-3-05 to reduce GHG emissions to 1990 levels by 2020. AB 32 also required CARB to prepare a Scoping Plan with the main strategies to be used to achieve reductions in GHG emissions in California.

On September 8, 2016, the Governor signed Senate Bill 32 into law, extending AB 32 by requiring the State to further reduce GHGs to 40 percent below 1990 levels by 2030. SB 32 became effective on January 1, 2017 and codified the 2030 goal set in EO B-30-15. SB 32 requires CARB to develop technologically feasible and cost-effective regulations to achieve the targeted 40 percent GHG emission reduction.

Statewide GHG reduction goals for the year 2050 have not been codified by the State Legislature. However, EO S-3-05, which was issued in 2005, called for statewide GHG reductions of 80 percent below 1990 levels by 2050. In March 2012, EO B-16-2012 was issued, and in 2015, SB 350 was enacted, both of which affirmed the long-range climate goal for California to reduce GHGs to 80 percent below 1990 levels by 2050.

On December 11, 2008, CARB approved the first Climate Change Scoping Plan, which included measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. Many of the GHG reduction measures included in the Climate Change Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted since approval of the Climate Change Scoping Plan. On May 22, 2014, CARB approved the first update to the AB 32 Climate Change Scoping Plan, which included new strategies and recommendations.

In December 2017, CARB adopted the second update to the Climate Change Scoping Plan. The 2017 Climate Change Scoping Plan update reflects the SB 32 statewide GHG emissions target. It defines

CARB's climate change priorities for the next five years and sets the groundwork to reach post-2020 statewide goals. The update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Climate Change Scoping Plan, identifies how the State can reach the 2030 GHG reduction target set under SB 32 of 40 percent below 1990 emissions levels, and discusses how the State can advance toward the 2050 climate goal set under Executive Order S-3-05 to reduce GHG emissions by 80 percent below 1990 levels. It also evaluates how to align the State's longer-term GHG reduction strategies with other State policy priorities, such as for water, waste, natural resources, clean energy and transportation, and land use (CARB 2017).

Renewable Portfolio Standard

Established in 2002 under Senate Bill 1078, California's Renewables Portfolio Standard (RPS) was accelerated in 2006 under Senate Bill 107 by requiring that 20 percent of electricity retail sales be served by renewable energy resources by 2010. Senate Bill X1-2, which implemented a 33 percent by 2020 for electricity sales from renewable energy resources, was signed in April 2011. This RPS applied to all electricity retailers in the state including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators (local communities that offer procurement service to electric customers within their boundaries). All of these entities must adopt the new RPS goals of 20 percent of retail sales from renewables by the end of 2013, 25 percent by the end of 2016, and the 33 percent requirement being met by the end of 2020.

In 2015, the Legislature enacted SB 350, which increased the RPS to require 50 percent of electricity generated to be from renewables by 2030. SB 350 also encourages a substantial increase in the use of electric vehicles. Section 740.12(b) of the Public Utilities Code now states that the California Public Utilities Commission, in consultation with CARB and the CEC, must "direct electrical corporations to file applications for programs and investments to accelerate widespread transportation electrification to reduce dependence on petroleum, meet air quality standards, ... and reduce emissions of greenhouse gases to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050."

Senate Bill 100, enacted in 2018, revised the above-described deadlines and targets so that the State will have to achieve 50 percent renewable resources by December 31, 2026 (instead of by 2030) and 60 percent target by December 31, 2030. The legislation also establishes a State policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045.

In summary, California has set a statutory goal of requiring that, by the year 2030, 60 percent of the electricity generated in California should be from renewable sources, and by 2045, all electricity must come from renewable resources and other carbon-free resources.

Low Carbon Fuel Standard

Executive Order S-1-07, the Low Carbon Fuel Standard (LCFS), was issued in January 2007. The order called for a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020. The LCFS was approved by CARB in 2009, and it became effective in April 2010. The regulation established annual performance standards for fuel producers and importers, applicable to all fuels used for transportation in California (CARB 2018).

In-Use Off-Road Diesel Vehicle Regulation

In 2007, CARB adopted a regulation to reduce diesel particulate matter and NO_x emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. The regulation imposes limits on unnecessary vehicle idling to five minutes and requires fleets to reduce NO_x emissions by retiring, replacing, repowering, or installing exhaust retrofits to older engines. Less idling translates into less fuel consumption and less indirect GHG emissions.

Commercial Vehicle Idling Regulation

The Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling requires that drivers of diesel-fueled commercial motor vehicles with gross vehicle weight ratings greater than 10,000 pounds, including buses and sleeper berth equipped trucks, not idle the vehicle's primary diesel engine longer than five minutes at any location. Less idling translates into less fuel consumption and less indirect GHG emissions.

Senate Bill 375

Senate Bill 375, the Sustainable Communities and Climate Protection Act of 2008, enhanced California's ability to reach its AB 32 goals, by promoting good land use and transportation planning with the goal of more sustainable communities. Senate Bill 375 requires CARB to develop regional GHG emission reduction targets for 2020 and 2035 for each region covered by one of the state's 18 metropolitan planning organizations (MPOs). The MPOs were tasked with developing Sustainable Communities Strategies, integrating land use and transportation planning and demonstrating an ability to attain the 2020 and 2035 reduction targets. In 2010, CARB adopted final regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035, and updated them in 2018. The San Joaquin Valley's Metropolitan Planning Organizations was assigned GHG emissions targets of a 12 percent per capita reduction for the year 2020 and a 16 percent per capita reduction for the year 2035 (CARB 2018).

Senate Bill 1386 (Wolk, Chapter 545, Statutes of 2016): Resource conservation, natural and working lands

Senate Bill 1386 declares it the policy of the State that protection and management of natural and working lands is an important strategy in meeting the State's GHG reduction goals. It requires State agencies to consider protection and management of natural and working lands in establishing policies and grant criteria, and in making expenditures, and "implement this requirement in conjunction with the State's other strategies to meet its greenhouse gas emissions reduction goals." For the purposes of this bill, "Working Lands" are defined as lands used for farming, grazing, or the production of forest products. "Natural lands" means lands consisting of forests, grasslands, deserts, freshwater and riparian systems, wetlands, coastal and estuarine areas, watersheds, wildlands, or wildlife habitat, or lands used for recreational purposes such as parks (public green space), urban and community forests, trails, greenbelts, and other similar open-space land.

Regional Policies and Regulations

San Joaquin Valley Air Pollution Control District

The San Joaquin Valley Air Pollution Control District (SJVAPCD) is primarily responsible for assuring that federal and State ambient air quality standards are attained and maintained in the San Joaquin Valley. It has also developed guidance documents and plans related to GHG emissions, as explained below.

SJVAPCD Climate Change Action Plan

The SJVAPCD's Climate Change Action Plan, adopted in 2008, directed the District Air Pollution Control Officer to develop guidance to assist lead agencies, project proponents, permit applicants, and interested parties in assessing and reducing the impacts of project specific GHG emissions on global climate change (SJVAPCD 2019).

SJVAPCD GHG Emissions Policy & Guidance

SJVAPCD Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA (SJVAPCD 2009) and District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency (SJVAPCD 2009) rely on the use of performance based standards, otherwise known as Best Performance Standards to assess significance of project specific greenhouse gas emissions on global climate change during the CEQA environmental review processes. Projects implementing Best Performance Standards would be determined to have a less than cumulatively significant impact. Otherwise, the SJVAPCD guidance and policy require demonstration of a 29 percent reduction in GHG emissions, from business-as-usual, consistent with CARB's AB 32 Climate Change Scoping Plan, to determine that a project would have a less than cumulatively significant impact. The SJVAPCD defines Best Performance Standards as "the most effective in-practice means of reducing or limiting GHG emissions from a GHG emissions source." Types of BPS include equipment type, equipment design, operational and maintenance practices, measures that improve energy efficiency, and measures that reduce vehicle miles traveled.

Local Policies and Regulations

Stanislaus County General Plan

Goal eleven in the Conservation Element of the Stanislaus County General Plan (Stanislaus County 2015) is to "Conserve resources through promotion of waste reduction, reuse, recycling, composting, ride-sharing programs, and alternative energy sources such as mini-hydroelectric plants, gas and oil exploration, and transformation facilities such as waste-to-energy plants." Policy thirty-one seeks to achieve this goal by encouraging new construction by the County to "meet or exceed code requirements for energy conservation."

Stanislaus County Code

As described in the Stanislaus County Code, Title 16: Building and Construction, Chapter 16.65: Energy Code (Stanislaus County 2017), Stanislaus County has adopted the California Energy Code, as published by the International Code Council, 2016 Edition, and Appendix 1-A as the Energy Code of the County.

3.9.3 Impact Analysis

Methodology for Analysis

This analysis follows the methodologies described in *Section 3.3, Air Quality* of *Chapter 3, Environmental Analysis* for estimating air pollutant emissions from construction and operation. Emissions were calculated using CalEEMod version 2016.3.2. CalEEMod contains numerous default assumptions and CARB emission factors for on-road and off-road vehicles (EMFAC 2014 and In-Use Off-Road Equipment Inventory Model 2011), which were incorporated into this analysis.

Similar to the methodology used for evaluating air quality pollutants, construction GHG emissions were modeled based on the detailed construction schedules and grading estimates that are summarized in *Section 2.4* of *Chapter 2, Project Description*.

Operation-related GHG emissions would result from limited mobile and area sources associated with ongoing operations and maintenance of the proposed facilities, and from existing vehicles traveling farther distances in response to the road relocation. CalEEMod inputs were based on estimates of Vehicle Miles Traveled (see *Section 3.13, Transportation and Traffic*).

GHG emissions would also result from energy consumed to power the pumping plant, and other components. The project would construct new electrical facilities, including a power supply line and electrical substation to power the pumping plant. Stanislaus County is served by three energy providers: Pacific Gas and Electric (PG&E), Modesto Irrigation District (MID), and Turlock Irrigation District (TID). TID provides power to the study area and would likely supply energy required for project operation.. Furthermore, for modeling purposes, TID has higher - therefore, more conservative - pollutant emissions factors than PG&E (TID has a CO_2 intensity factor of 790 lb/MWh, versus a CO_2 intensity factor of 641 lb/MWh for PG&E).

Criteria pollutant emissions from power plants are associated with the power plants themselves, not individual projects or electricity users, because they are existing stationary sources permitted by air districts and/or the USEPA, and they are subject to local, State, and federal control measures. However, GHG emissions from power plants are not regulated in the same way. Therefore, CalEEMod attributes GHG emissions associated with electricity consumption to individual projects.

Further detail on CalEEMod inputs and outputs are available in Appendix D.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines*, as updated in December 2018 an impact on greenhouse gas emissions would be considered significant if the project would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; and/or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Defining a level of greenhouse gas emissions at which an individual project may have a significant impact on the environment has been a source of debate (and litigation) ever since this resource topic was added to Appendix G of the *CEQA Guidelines* in 2009. The difficulty arises from the fact that climate change is a global phenomenon; most individual projects will not result in enough GHG to change the course of climate change on their own, even though they would contribute to the problem. In late 2015, the California Supreme Court's Newhall Ranch decision confirmed that there are multiple potential pathways for evaluating GHG emissions consistent with CEQA, depending on the circumstances of a given project (*Center for Biological Diversity v. Department of Fish and Wildlife* (2015) 62 Cal. 4th 204 *(Newhall Ranch)*; see also, *Cleveland National Forest Foundation v. SANDAG* (2017) 3 Cal.5th 497). The decision also identified the need to analyze both near-term and post-2020 emissions, as applicable, stating that an "EIR taking a goal-consistency approach to CEQA significance may in the near future need to consider the project's effects on meeting longer-term emissions reduction targets." The post-2020 Statewide GHG reduction goals applicable to the proposed project are the 40 percent below 1990 levels 2030 target set under SB 32, and the more aggressive targets set forth in Executive Orders S-03-05 (80 percent below 1990 by 2050) and B-55-18 (carbon neutrality as soon as possible and no later than 2045), as explained in the *Regulatory Framework* above.

The post-2020 Statewide GHG reductions would be shared across California's energy, transportation, industrial, water, waste management, and agricultural sectors. The water sector's fair share contribution to the Statewide GHG reduction goals may be more or less than the overall Statewide target because they would be combined with the measures taken by all of the other sectors. For the purposes of this analysis, the GHG reduction goal for the water sector has been interpreted from the 2017 Climate Change Scoping Plan. In the 2017 Climate Change Scoping Plan (CARB 2017), CARB suggests a GHG significance threshold for the water sector in one of the "potential actions" on page 95, which reads: "Where technically feasible and cost-effective, local water and wastewater utilities should adopt a long-term goal to reduce GHGs by 80 percent below 1990 levels by 2050 (consistent with DWR's Climate Action Plan), and thereafter move toward low carbon or net-zero carbon water management systems." The Project Partners have not conducted a GHG emissions inventory, or established 1990 baseline GHG emissions upon which a long-term, 80 percent GHG reduction by 2050 goal could be based. Therefore, the suggested "low carbon or net-zero carbon" long-term threshold could be applied on a project-by-project basis instead of the goal of 80 percent below 1990 levels by 2050. The "low carbon or net zero carbon" threshold is consistent with Statewide GHG reduction goals for post-2050.

Alternatively, Del Puerto Water District, as lead agency, could rely on thresholds of significance set by other lead agencies in California. Sacramento Metropolitan Air Quality Management District updated its CEQA Guidelines in May 2018 to account for, among other regulations, the SB 32 and 2017 Climate Change Scoping Plan 2030 GHG reduction targets (SMAQMD 2018). The SMAQMD thresholds were developed to ensure at least 90 percent of new GHG emissions would be reviewed and assessed for mitigation. SMAQMD sets significance thresholds of 1,100 MT CO_2e for the construction phase and

10,000 MT CO_2e for the operational phase of stationary sources. The proposed project is most similar to a stationary source because the project is an infrastructure use, and the majority of the project's emissions would be associated with power use on site at the pumping plant.

Although CEQA allows lead agencies to use thresholds of significance developed by other lead agencies (CEQA Guidelines, Section15064.7), this analysis relies on the more conservative significance threshold suggested in the 2017 Climate Change Scoping Plan for water management systems to achieve low carbon or net-zero carbon by 2050, as tempered by the accelerated goals of SB 100, which the Legislature passed after the 2017 Climate Change Scoping Plan had been adopted. The proposed project lifetime is expected to be at least 100 years, well beyond the mid-term GHG emissions goal horizon year of 2030. For the first CEQA Appendix G question, therefore, this analysis employs a threshold of avoiding any net positive carbon emissions by 2045, which concurrently achieves the project's fair share of Statewide GHG reductions required under SB 32 for 2030.

Impacts and Mitigation Measures

Impact GHG-1 Generate greenhouse gas emissions that may have a significant impact on the environment

Construction Impacts

Table 3.9-1 shows construction GHG emissions. Most of the construction GHG emissions would occur in year 2025 and most of the emissions in that year would be associated with on-site construction activities from the combined construction of the roadway grading and paving activities; dam facilities (main dam, saddle dams, outlet works, and spillway); utilities transmission lines; conveyance facilities open cut trenching; tunneling for the outlet and conveyance; and the pumping plant. In 2027, emissions would include minor amounts of methane that would be generated by reservoir inundation.

Table 3.9-1: Estimated Construction Emissions of Greenhouse Gases

Year	GHG Emissions (MT CO2e/year)
2022	1,112
2023	4,060
2024	10,328 ~~05~~
2025	18,015 ~~214~~
2026	15,261
2027	1,020 [1] ~~734~~
Total	**49,796** ~~**50,185**~~

[1] Includes methane emissions from reservoir filling

Operation Impacts

Table 3.9-2 shows operational GHG emissions. Mobile sources of GHG emissions would occur as a result of limited operations and maintenance trips. The proposed relocated roadway is expected to result in an additional 149 VMT per year (Fehr & Peers 2019). Area sources of GHG emissions are related to minimal landscaping activities. The primary source of ongoing, indirect GHG emissions would be electricity consumed to power the conveyance facilities, pumping plant, and other components. These operations are estimated to consume 40,447,020 kWh per year.

Table 3.9-2: Estimated Long-Term Annual Emissions of Greenhouse Gases

Source	GHG Emissions (MT CO2e/year)
Area	2
Energy	14,473
Mobile	26
Total	**14,500**

Significance before Mitigation

The proposed project would comply with existing regulations, including vehicle idling restrictions, the Advanced Clean Car Program and Renewable Portfolio Standard. The proposed project would also maximize energy efficiency, in accordance with Stanislaus County General Plan policies and Stanislaus County Title 16 Building and Construction code. As discussed in *Section 3.7, Energy*, the project design specifications rely on the use of high-efficiency equipment, including the five 2,500 Hp motors that would power the pumping plant to convey water to and from the DMC, and project lighting would be compliant with the California Building Energy Efficiency Standards (Title 24).

Even so, the proposed construction activities and ongoing energy consumption would result in GHG emissions that would be far above the threshold of no net additional GHG emissions. Impacts would be significant and mitigation would be required to lower the environmental impact of GHG emissions as much as possible.

Mitigation Measures

Mitigation Measure GHG-1: Best Performance Standards

The Project Partners shall implement all feasible Best Performance Standards. The SJVAPCD defines Best Performance Standards as "the most effective in-practice means of reducing or limiting GHG emissions from a GHG emissions source."

Types of Best Performance Standards that the proposed project shall implement during construction could include but would not be limited to:

- Use equipment types that rely on electric and/ or hybrid fuel, which has the potential to reduce GHG emissions up to 22% (CAPCOA 2010). Note that biodiesel fuel use, while beneficial for reducing particulate matter emissions, does not have a substantial effect, and may actually increase, NO_X and CO_2e emissions.
- Limit the size of the construction vehicle fleet, especially vehicles with high Hp (e.g., helicopters), as much as possible.
- Limit the amount of time that construction vehicles are operating.
- Maintain construction equipment in the best possible working order to maximize engine fuel efficiency.
- All equipment shall be operated by a properly trained worker to minimize unnecessary vehicle use.
- Encourage workers to carpool to and from the site.
- Phase vendor and hauling trips.
- Where cost effective, mitigate the project's GHG emissions through the one-time purchase of accredited carbon offsets (current price is approximately $0.50/MT$CO_2$e for international

offsets, \$3.50/$MTCO_2e$ for offsets within the United States, and \$8.50~~15~~/$MTCO_2e$ for in-state offsets).

Types of Best Performance Standards that the proposed project shall implement during long-term operations include:

- Implement the most energy efficient equipment design possible
- Rely on alternative sources of energy, such as solar or wind power
- Encourage operations and maintenance employees to carpool or otherwise commute using a method other than a single-occupancy fossil-fuel powered vehicle

Significance after Mitigation

The Project Partners would reduce GHG emissions to the maximum extent feasible through implementation of Mitigation Measure GHG-1. Even so, the proposed project is expected to result in significant and unavoidable GHG emissions during construction and operation.

Impact GHG-2 Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases

Construction and Operation Impacts

The applicable plan is the 2017 CARB Climate Change Scoping Plan because it addresses greenhouse gas emissions reduction targets for the water sector in both the 2030 and 2050 horizon years. According to the 2017 Climate Change Scoping Plan, ten percent of the State’s energy use is associated with water-related end uses. The 2017 Climate Change Scoping Plan does not include numerical GHG emissions reduction thresholds for California’s water sector. However, it recognizes that GHG emissions from the water sector result primarily from the fossil fuel-based energy consumed for water end uses (e.g., heating, cooling, pressurizing, and industrial processes), and the fossil fuel-based energy used to “produce” water (e.g., pump, convey, treat). Therefore, emissions reductions strategies in the 2017 Climate Change Scoping Plan are primarily associated with reducing the energy intensity of the water sector.

A portion of the water that would be pumped into the proposed reservoir would, under existing circumstances, be pumped into the San Luis Reservoir, with the remainder used directly by the Project Partners. Storage of surface water in the San Luis Reservoir requires similar or greater levels of pumping, and associated energy consumption and indirect GHG emissions, as storage in the proposed project. Water pumped from the DMC into San Luis Reservoir is powered by the San Luis (William R. Gianelli) Powerplant and the O’Neill Power Plant, The San Luis Power Plant was constructed in 1968 and has eight pumping-generating units. The O’Neill Power Plant consists of six pumping-generating units constructed in 1967. The plants lift water into the San Luis Reservoir, then during the irrigation season, water is released back through the pump-turbines and about 70 percent of the energy is reclaimed (USBR 2019). The pumps associated with the proposed project would be newer and, presumably, more energy efficient. Therefore, a portion of the operational energy use for the proposed project would be offset by reductions in energy required to pump water into San Luis Reservoir. In this way, it would be consistent with the goal of the 2017 Climate Change Scoping Plan to lower the fossil-fuel based energy used to pump water.

The 2017 Climate Change Scoping Plan also recognizes that natural and working lands (forests, rangelands, farms, wetlands, riparian areas, deserts, coastal areas, and the ocean) are a key sector in the State’s climate change strategy. It states that keeping these lands and waters intact and at high levels of ecological function, including resilient carbon sequestration, is necessary for the well-being and security of Californians in 2030, 2050, and beyond. Storing carbon in trees, other vegetation, soils, and aquatic sediment is an effective way to remove carbon dioxide from the atmosphere and the Scoping Plan describes policies and programs that prioritize protection of those resources to maintain them as a carbon sink. The Scoping Plan promotes, for example, conserving agricultural land, sequestering carbon in agricultural soils, and increasing the efficiency of on-farm water and energy use to achieve climate and food production goals.

The proposed project would create a more reliable source of water for the farms and rangelands with the Project Partners' service area. Without the proposed project, the working lands in the Project Partners' service area could turn to water stored in the San Luis Reservoir, groundwater, or water transfers; however, these water sources are unreliable and without the proposed project, many working lands would likely be fallowed during dry years. By keeping these farms and rangelands in production and giving them the opportunity to implement healthy soil management practices, reduce emissions from the livestock sector, and continue water conservation practices, the proposed project would support the 2017 Climate Change Scoping Plan of maintaining the State's working lands as a carbon sink.

Significance before Mitigation

The proposed project would be consistent with the 2017 Climate Change Scoping Plan in that it would lower the energy intensity of a portion of the water upon which existing agricultural operations rely. In addition, the Project Partners have an incentive to operate the proposed project in the most energy efficient manner possible in order to reduce operational energy costs. Thus, the project would install pumps and conveyance infrastructure meeting the most current applicable efficiency standards. The proposed project also supports the 2017 Climate Change Scoping Plan goal of maintaining natural and working lands as carbon sinks. Therefore, the project would not be inconsistent with CARB's 2017 Climate Change Scoping Plan.

The proposed project would be an investment in efficient infrastructure for water resources, which is consistent with California's strategy for adapting to the effects of Climate Change. While not a plan that reduces emissions of greenhouse gases, the California Climate Adaptation Strategy (California Natural Resources Agency 2009) addresses adaptation to climate change through several strategies. The proposed project would support the strategy of expanding available water storage for surface water.

Even though the proposed project would be implemented in the most energy-efficient way possible, it involves a new reservoir and associated infrastructure that would consume significant amounts of energy, which would result in a significant amount of indirect greenhouse gas emissions. Because construction and operations would result in substantial emissions, mitigation is proposed to reduce impacts and ensure consistency with applicable plans and policies.

Mitigation Measures

See **Mitigation Measure GHG-1**.

Significance after Mitigation

The proposed project would support, at least in part, the 2017 Climate Change Scoping Plan objectives of reducing the energy intensity of water treatment and conveyance. Through **Mitigation Measure GHG-1**, the project would reduce direct and indirect GHG emissions to the extent feasible. In addition, it would support specific strategies the State has identified for conserving farms and rangelands and adapting to the effects of climate change. However, the proposed project's GHG emissions would still be substantial. Therefore, with incorporation of **Mitigation Measure GHG-1**, impacts would be significant and unavoidable.

Cumulative Impact Analysis

Although the majority of individual projects do not generate sufficient GHG emissions to directly influence climate change, physical changes caused by a project can contribute incrementally to cumulative effects that are significant, even if individual changes resulting from a project are limited. The issue of climate change typically involves an analysis of whether a project's contribution towards an impact would be cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15064[h][1]). GHG emissions and climate change are, by definition, cumulative impacts because they affect the accumulation of greenhouse gases in the global atmosphere. Therefore, the impact analysis for the project encompasses both a project-level and cumulative analysis.

The geographic scope of the cumulative impacts on GHG emissions is defined as the State of California, encompassing the study area and surrounding areas, because this is the scope for which appropriate cumulative thresholds have been established. If the proposed project, as well as other projects listed in **Table 3.0-1**, would cause a cumulatively considerable increase in GHG emissions, they could result in significant cumulative impacts on GHG emissions.

Significance Determination

The proposed project would result in a significant and unavoidable impact related to GHG emissions. Therefore, even with incorporation of all feasible mitigation measures, impacts would be cumulatively considerable.

Mitigation Measures

See **Mitigation Measure GHG-1**.

3.9.4 References

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3.10 Hazards and Hazardous Materials

The following section describes the environmental setting for hazards and hazardous materials in the study area, including the project site and adjacent areas that could be affected by the use or presence of hazardous materials. The California Health and Safety Code defines hazardous materials as a material that because of its "quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment" (Section 25501(o)). Potential hazards addressed in this section include the mobilization of or exposure of workers to existing hazardous materials in soils and potential releases of hazardous materials during construction. The impact analysis evaluates anticipated hazardous materials and hazards-related impacts to public health or the environment that would result from construction or operation of the project.

3.10.1 Environmental Setting

Through natural events, system failures, and accidents (spills), hazardous materials have the potential to pose a risk to the environment and human health. Numerous local, state, and federal laws exist to regulate the storage, use, handling, and transportation of hazardous materials. To increase public safety and awareness of hazardous materials exposure risk, businesses and other entities that handle, store, transport, or use hazardous materials are required to file reports with appropriate authorities and maintain emergency response plans in the event of a hazardous materials release. The project area was evaluated for the presence of hazardous materials sites including known contamination sites and utility lines such as natural gas and petroleum pipelines that could present a hazard during construction.

Hazardous Materials

Known Contamination Sites

Two online databases were searched for known contamination sites within the study area, including EnviroStor (State Department of Toxic Substances [DTSC] Hazardous Waste and Substances Site List) and GeoTracker (State Water Resources Control Board).

The EnviroStor database identifies sites that have known contamination or sites for which there may be reasons for further investigation. Specifically, it lists the following site types: Federal Superfund sites (National Priority List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. Sites that are in the Hazardous Waste and Substances Site List Site Cleanup (Cortese List) are also identified.

The GeoTracker is an online tool that provides regulatory data regarding sites that impact groundwater, particularly those that require groundwater cleanup, as well as permitted facilities such as those operating underground storage tanks and land disposal sites (SWRCB 2010).

A search of these two databases shows no known contamination sites within 1,000 feet of all proposed project components.

Potentially Hazardous Utility Lines

Existing utilities are located within the proposed project site boundaries, including a natural gas pipeline and petroleum pipeline, as seen in **Figure 3.15-1**. A PG&E natural gas pipeline is located between the California Aqueduct and Interstate 5; proposed conveyance pipelines from the dam to the DMC would need to cross under the gas pipeline. There is also a petroleum pipeline operated by Shell Pipeline Company that is located within the proposed reservoir footprint. The petroleum pipeline would require relocation, and Shell would remove the old pipeline and construct a new one before project construction starts. The natural gas pipeline would not be moved.

Presence of On-Site Oil Wells

A review of the Division of Oil, Gas and Geothermal Resources (DOGGR)[1] website indicates there are six dry plugged oil wells within the study area (DOGGR, 2019b). When oil or gas is no longer found in a well, it is considered dry and plugged. It is abandoned through permanent sealing. A well is plugged by placing cement in the well-bore at certain intervals as specified in California laws or regulations and buried by filling the hole with drilling mud (DOGGR, 2019a). Because wells may have had an oil sump near the well there is a potential that soil contaminated with hydrocarbons could be present adjacent to abandoned wells. **Figure 3.10-1** shows dry wells in the vicinity of the reservoir, which are numbered 1 through 6. Dry well number 1, Phillips Petroleum, is located in the proposed utility realignment corridor. Dry well 2 is located in the footprint of the proposed South Access Egress, near a saddle dam. Dry well 6 is located within the footprint of the proposed relocated road. No wells are located within the vicinity of the Spillway or the Main Dam. Dry well locations were downloaded from DOGGR's Well Finder, which includes a disclaimer regarding the exact location of oil wells. Website data is supplied by third parties and while the content is believed to be reliable, there is no warranty regarding accuracy. According to current projections, Dry well 3 is located within the inundation area of the proposed reservoir. The well is at ground-level (approximately 440 feet in elevation), therefore within the high-water mark of 450 feet, as seen in **Figure 3.10-2**. This figure also demonstrates dry wells 4 and 5 are located just above the reservoir high-water mark of 450 feet. Well locations and the associated oil well sumps would be verified by Project Partners prior to construction.

Wildland Fire Hazards

The proposed project is in an area designated for agricultural use by Stanislaus County (Stanislaus County 2015). California Department of Forestry and Fire Protection (CAL FIRE) has developed a Fire Hazard Severity Zone ranking system that predicts the likelihood of an area burning. The model is based on vegetation, topography, weather, crown fire potential, and ember production and movement.

The proposed project is located to the west of Interstate 5 and is designated as a State Responsibility Area (SRA), indicating that CAL FIRE is responsible for fire management in that area. The project site is designated as Medium and High Fire Hazard Severity Zones (CAL FIRE 2007b). The closest Very High Fire Hazard Severity Zone is located more than 3 miles to the west of the study area. Large portions of the project area near Interstate 5 burned in June 2019 in a grass fire, known as the Rock Fire, which burned 2,422 acres (CalFIRE 2019).

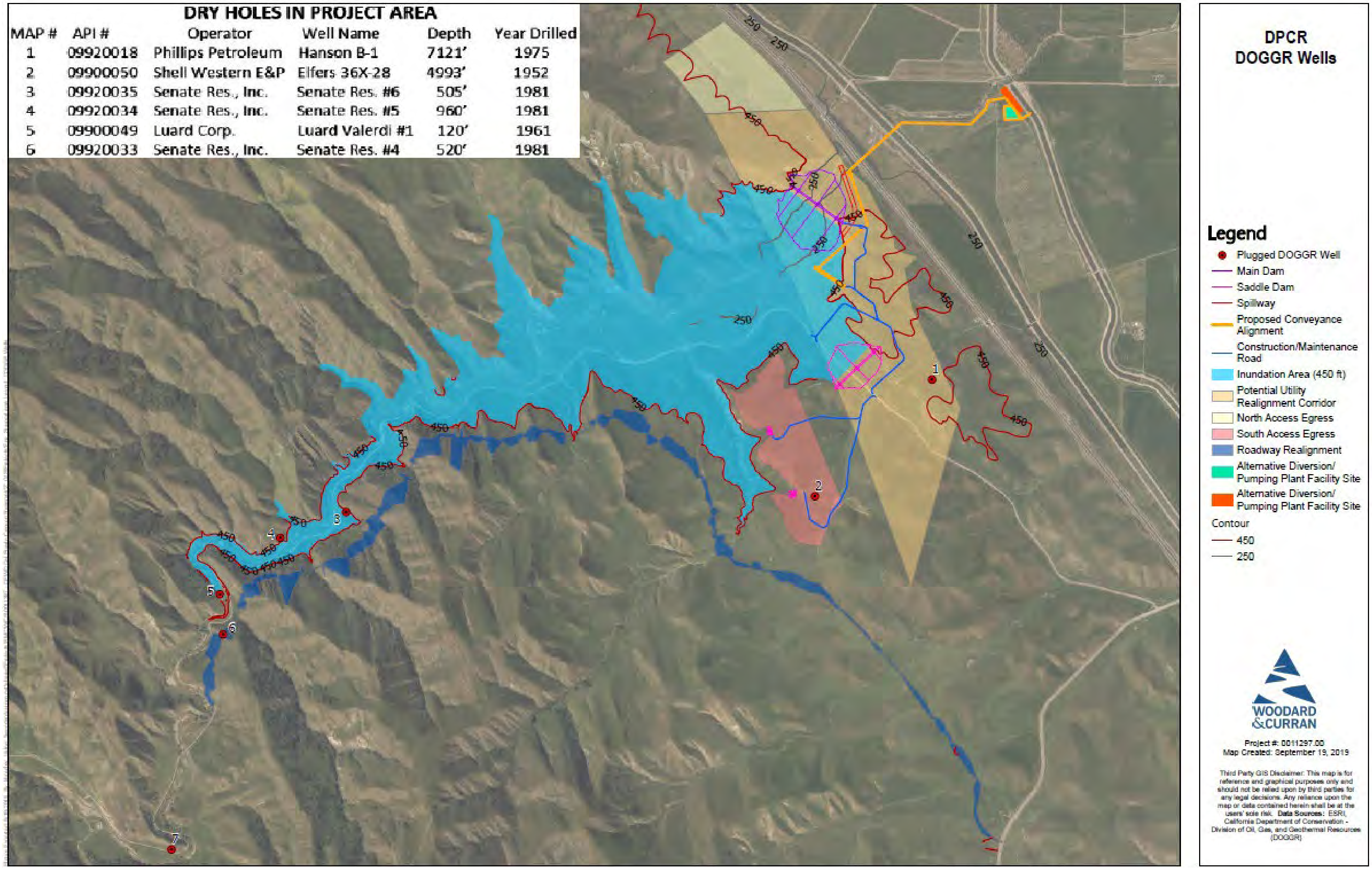
3.10.2 Regulatory Framework

Hazardous materials and wastes can result in public health hazards if released to soil, groundwater, or air. Hazardous materials as defined in Section 25501(o) of the California Health and Safety Code are materials that, because of their "quantity, concentration, or physical or chemical characteristics, pose a significant present or potential hazard to human health and safety or to the environment if released to the workplace or environment." Hazardous materials have been and are commonly used in commercial, agricultural, and industrial applications, as well as to a limited extent in residential areas.

A waste is any material that is relinquished, recycled, or inherently waste-like. CCR Title 22 Section 66261.1, et seq. contains regulations for the classification of hazardous wastes. Article 3 criteria classify waste as hazardous if it is toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases). Article 4 also lists specific hazardous wastes, while Article 5 identifies specific waste categories,

[1] In January 2020 the Division of Oil, Gas and Geothermal Resources (DOGGR) became the California Geologic Energy Management Division (CalGEM). For consistency with the Draft EIR, most references to DOGGR have not been changed.

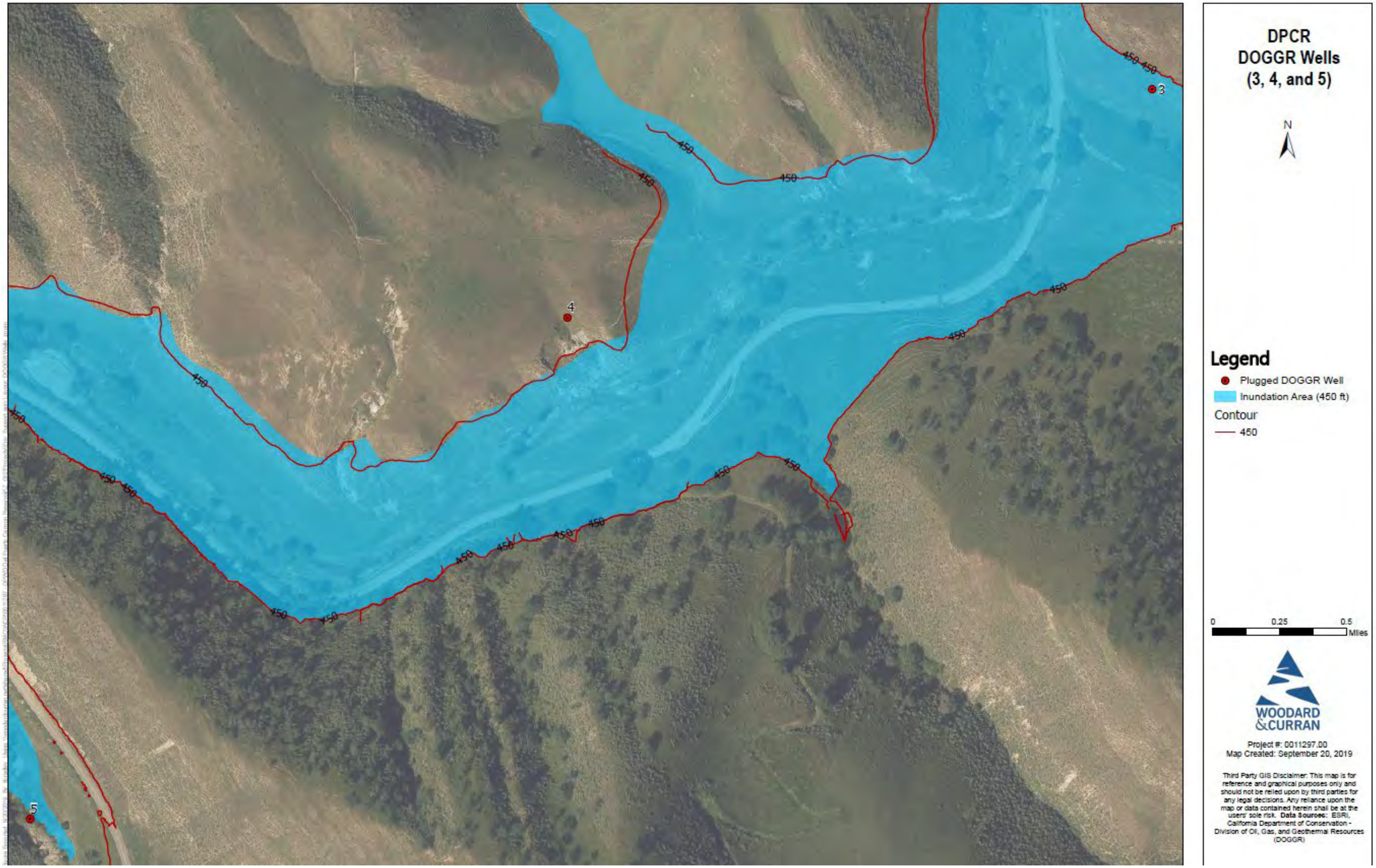
Figure 3.10-1: DOGGR Dry Wells in Study Area



DRY HOLES IN PROJECT AREA

MAP #	API #	Operator	Well Name	Depth	Year Drilled
1	09920018	Phillips Petroleum	Hanson B-1	7121'	1975
2	09900050	Shell Western E&P	Elfers 36X-28	4993'	1952
3	09920035	Senate Res., Inc.	Senate Res. #6	505'	1981
4	09920034	Senate Res., Inc.	Senate Res. #5	960'	1981
5	09900049	Luard Corp.	Luard Valerdi #1	120'	1961
6	09920033	Senate Res., Inc.	Senate Res. #4	520'	1981

Figure 3.10-2: DOGGR Dry Wells Near the Inundation Area



including Resource Conservation and Recovery Act (RCRA) hazardous wastes, non-RCRA hazardous wastes, extremely hazardous wastes, and special wastes. If improperly handled and released to soil, groundwater, or air (in the form of vapors, fumes, or dust), hazardous materials and wastes can result in public health hazards.

This section describes laws and regulations that may apply to the proposed project.

Federal Policies and Regulations

Resource Conservation and Recovery Act (RCRA)

RCRA regulates potential health and environmental problems associated with solid waste hazards and nonhazardous waste. RCRA defines solid waste as garbage or refuse, sludge from wastewater treatment plant, water supply treatment plant, or air pollution control facility, and other discarded materials. Solid waste can be either hazardous or non-hazardous. Hazardous waste is waste that burns readily, is corrosive, or reactive, or if it contains certain amounts of toxic chemicals, or has been included on the U.S. EPA's list of hazardous wastes. RCRA regulates the disposal of waste and aims to reduce waste generation. It restricts which facilities can receive hazardous wastes and regulates facilities to ensure proper handling of materials.

Emergency Planning and Community Right-To-Know Act (EPCRA)

EPCRA was passed in 1986 and requires federal, state, and local governments to create chemical emergency response plans for releases of hazardous substances. It also requires reporting on hazardous and toxic chemicals to increase awareness and access to information on chemical and individual facilities. It requires that facilities report accidental releases of certain chemicals and hazardous substances, and provide such information to the public. Facilities must create and make available Material Safety Data Sheets (MSDS) that describe the chemicals in question and health effects associated with them. Chemical inventories must also be reported if they require an MSDS.

Hazardous Materials Worker Safety Requirements

The federal Occupational Safety and Health Administration (OSHA) is the federal agency responsible for ensuring worker safety. The federal regulations for worker safety are contained in CFR Title 29, as authorized in the Occupational Safety and Health Act of 1970; these regulations provide standards for safe workplaces and work practices, including those relating to hazardous materials handling.

Preliminary Remediation Goals

USEPA has published screening levels, referred to as Regional Screening Levels (RSLs), for the evaluation of chemicals commonly found in soil or groundwater where a release of hazardous materials has occurred (USEPA 2019). For an industrial worker, these screening levels are conservative estimates of safe levels of a chemical that a worker could be exposed to in soil and groundwater. If the concentration of a chemical in the soil or groundwater is below the RSL, then it can be assumed that the chemical would not pose a health risk to the worker. Screening levels would generally be lower for industrial workers than construction workers because the industrial worker would be exposed to the hazard over a lifetime while the construction worker would only be exposed for the duration of construction. Therefore, safe levels of chemicals in soil and groundwater would generally be higher for construction workers than industrial workers.

Risk Management Plan

The EPA created regulations and guidance for chemical accident prevention at facilities using substances that posed the greatest risk of harm from accidental releases. Under the authority of Section 112(r) of the Clean Air Act, the Chemical Accident Prevention Provisions creates require facilities that produce, handle, process, distribute, or store certain chemicals to develop a Risk Management Program, prepare a Risk Management Plan, and submit the plan to EPA.

State Policies and Regulations

California Health and Safety Code

The California Health and Safety Code contains statewide regulations designed to protect public health and safety. Sections of the state code relevant to the proposed project/action include the Hazardous Materials and the Hazardous Waste and Substances Site List (Cortese List), which is developed under Section 65962.5 of the California Government Code. The list is compiled and maintained by the DTSC under the California EPA. The Cortese List is a list of all sites identified as having hazardous waste releases.

Facilities that handle, store, use, treat, dispose of, or generate hazardous materials are required to create hazardous-waste management programs under Division 20, Chapter 6.5, section 25100 et seq. Facilities that generate hazardous wastes in excess of 26,400 pounds per year, or extremely hazardous wastes in excess of 26.4 pounds per year, must adhere to California Health and Safety Code Section 25244.12 et seq. This section of the code requires facilities to determine the types and amounts of wastes generated, identify procedures to reduce waste generation, develop written documentation that addresses waste reduction, develop a source-reduction evaluation review and plan, prepare a plan summary and hazardous waste management report, and a report summary. Hazardous materials handling, reporting requirements, and local agency surveillance programs are regulated under the California Health and Safety Code, Section 25500 et seq.

Transportation of Hazardous Wastes

Regulatory requirements for the transport of hazardous wastes in California are specified in CCR Title 22 Division 4.5 Chapters 13 and 29. In accordance with these regulations, all hazardous waste transporters must have identification numbers issued by either the USEPA or the California Department of Toxic Substances Control (DTSC) to identify whether the waste is classified as hazardous by federal regulations or under California regulations. Hazardous waste transporters must comply with the California Vehicle Code, California Highway Patrol regulations (CCR, Title 13), the California State Fire Marshal regulations (CCR Title, 19), U.S. Department of Transportation regulations (CFR, Title 49), and USEPA regulations (CFR, Title 40). California regulations specify specific cleanup actions that must be taken by a hazardous waste transporter in the event of a discharge or spill, and for the safe packaging and transport of hazardous wastes.

California Fire Code

The California Fire Code, Article 80, includes specific requirements for the safe storage and handling of hazardous materials. These requirements reduce the potential for a release of hazardous materials and for the mixing of incompatible chemicals, and specify design features to reduce the potential for a release of hazardous materials that could affect public health or the environment, including:

- Separation of incompatible materials with a noncombustible partition
- Spill control in all storage, handling, and dispensing areas
- Separate secondary containment for each chemical storage system

The California Fire Code, Article 79, includes specific requirements for the safe storage and handling of flammable and combustible liquids. Specific requirements address:

- Fire protection
- Prevention and assessment of unauthorized discharges
- Labeling and signage
- Protection from sources of ignition
- Specifications for piping, valving, and fittings

- Maintenance of above-ground tanks
- Requirements for storage vessels, vaults, and overfill protection
- Requirements for dispensing, using, mixing, and handling of flammable and combustible liquids

Division of Oil, Gas, and Geothermal Resources (DOGGR)[2]

The California Department of Conservation, DOGGR oversees the drilling, operation, maintenance, and plugging and abandonment of oil, natural gas, and geothermal wells. DOGGR also oversees enhanced recovery projects that try to maximize production from the state's oil reservoirs. The regulatory program implemented by DOGGR includes acting as a clearinghouse for information about the state's oil, natural gas and geothermal industries, monitoring the proper installation and maintenance of blowout prevention equipment, regulating well design, ensures that idle and orphan wells are properly plugged and abandoned, regulating geothermal wells and offshore drilling, and ordering the re-abandonment of any well that is considered hazardous or poses a danger to health, the environment or natural resources.

Waste Classification Criteria

In accordance with CCR Title 22 Section 66261.20, et seq., excavated soil would be classified as a hazardous waste if it exhibits the characteristics of ignitability, corrosivity, reactivity, or toxicity.
A waste is considered hazardous by state and federal regulations if the soluble concentration exceeds the federal regulatory level as determined by the toxicity characteristic leaching procedure (TCLP). A waste is considered hazardous under state regulations if the soluble contaminant concentration exceeds the soluble threshold limit concentration (STLC). A waste may also be classified as toxic if testing indicates toxicity greater than the specified criteria.

Hazardous Materials Worker Safety Requirements

The state regulations concerning the use of hazardous materials in the workplace are included in CCR Title 8, and include requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA standards are generally more stringent than federal OSHA regulations. Cal/OSHA also enforces hazard communication program regulations, which contain worker safety training and hazard information requirements, such as procedures for identifying and labeling hazardous substances, communicating hazard information relating to hazardous substances and their handling, and preparation of health and safety plans to protect workers. CCR Title 8, Subchapter 4. Construction Safety Orders, Article 36. Fire Protection and Prevention, establishes limits on storage of fuels at construction sites. A maximum of 660 gallons of fuel or other flammable materials can be stored in approved portable tanks. Cal/OSHA also establishes permissible exposure limits for hazardous materials that may be encountered in the work place.

California Accidental Release Program

California Health and Safety Code (CHSC) Section 25531 and the California Accidental Release Program (CalARP) regulate the registration and handling of regulated substances. CalARP incorporates the requirements of the federal Risk Management Plan rule but is more stringent with respect to the threshold quantities of chemicals requiring Risk Management Plans and includes more chemicals than the federal program. Regulated substances are any chemicals designated as an extremely hazardous substance by the USEPA as part of its implementation of SARA Title III or by the State of California pursuant to CHSC Section 25532. The requirements of CHSC Section 25531 overlap or duplicate some of the requirements of SARA and the Federal Clean Air Act. Facilities handling or storing regulated substances at or above Threshold Planning Quantities must register in the California Environmental Reporting System, and prepare a Risk Management Plan. CalARP is found in CCR Title 19 Chapter 4.5. The Risk Management

[2] Now the California Geologic Energy Management Division (CalGEM)

Plan is implemented by the business to prevent or mitigate releases of regulated substances that could have off-site consequences through hazard identification, planning, source reduction, maintenance, training, and engineering controls.

Local Policies and Regulations

Stanislaus County General Plan

The Stanislaus County General Plan (Stanislaus County 2016) guides development for the County with a 20-year planning horizon. The following policy in the Stanislaus County General Plan, Safety Element would apply to the project:

> **Policy Thirteen***:* The Department of Environmental Resources shall continue to coordinate efforts to identify locations of hazardous materials and prepare and implement plans for management of spilled hazardous materials as required.

Stanislaus County Hazardous Materials Business Plan

As required under Chapter 6.95 of the California State Health and Safety Code, businesses that use, handle, or store a hazardous material or an extremely hazardous material over specified limits are required to submit Hazardous Materials Business Plans to Stanislaus County (Stanislaus County 2019). These limits include quantities greater than or equal to 500 pounds of a solid substance, 55 gallons of a liquid, 200 cubic feet of compressed gas, and hazardous waste in any quantity. Business Plans contain information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed of within the County.

The Hazardous Materials Division of the Department of Environmental Resources at Stanislaus County performs routine inspections at businesses required to submit Business Plans to ensure compliance with existing laws and regulations, to identify existing safety hazards, and to suggest preventative measures.

The Hazardous Materials Business Plan must be recertified every year by reviewing the information currently in the California Environmental Reporting System and submitting each element of the Hazardous Materials Business Plan (Stanislaus County 2019). Business Plan information must be amended in the California Environmental Reporting System within 30 days if there is any increase in quantity of a hazardous material at the business, if there is any handling of a previously undisclosed hazardous material, if there is any change in the storage, location or use of hazardous materials, or if there is any change to the business details, including a change in the site map.

Stanislaus County Department of Environmental Resources Hazardous Materials Division

Under California Health and Safety Codes 101325, 25404.1.1 and 13801, Stanislaus County requires the acquisition of a permit for any monitoring well construction borings.

City of Patterson General Plan

The City of Patterson General Plan (City of Patterson 2010) set a vision for a “vibrant, economically sound and culturally diverse community as the ‘capital’ of western Stanislaus County”. The following goal and policies in the City of Patterson General Plan, Health and Safety Element would apply to the project:

Goal HS-7*:* To protect the health and safety of Patterson residents from the harmful effects of the use, transport, and disposal of hazardous substances.

> **Policy HS-7.3:** Management of hazardous materials. The City shall regulate the storage of hazardous and waste materials consistent with state and federal law. The City shall not permit above ground tanks without considering the potential hazards that would result from the release of stored liquids caused by possible rupture or collapse and may request applicants to have an emergency response plan.

Policy HS-7.4: Industrial Facilities. The City shall work with responsible agencies to ensure that all industrial facilities are constructed and operated in accordance with the most current safety and environmental protection standards.

3.10.3 Impact Analysis

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant hazards and hazardous materials impacts. Impacts are evaluated based on the known potentially hazardous materials that would be used or stored on site during construction and operation, potential for accidental hazardous substance release, and presence of other health-threatening factors in the proposed project vicinity. Each potential impact is assessed in terms of the applicable regulatory requirements. Mitigation measures are identified for significant impacts.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines*, a hazard or hazardous materials impact would be considered significant if the project would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- 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.
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
- 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, create a significant hazard to the public or the environment.
- 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, result in a safety hazard for people residing or working in the project area.
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

Criteria Requiring No Further Evaluation

The Initial Study determined that the project would not have significant impacts associated with the following criteria:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.
- 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, result in a safety hazard for people residing or working in the project area.

- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

Impacts and Mitigation Measures

Impact HAZ-1 Create a Hazard through Reasonably Foreseeable Upset and Accident Conditions to the Public and the Environment Involving Release of Hazardous Materials into the Environment

Construction Impacts

Construction of the proposed project could create a potential hazard to the public or environment through upset and accident conditions involving release of hazardous materials used in construction, which include diesel fuel and minor amounts of paints, fuels, solvents and glues. These materials would generally be used in excavation equipment, generators, and other construction equipment and would be contained within vessels engineered for safe storage. These materials would be stored at the construction sites.

Six abandoned oil wells are located on or near the project construction area, resulting in the potential for encountering hydrocarbon-impacted soil in the vicinity of the wells. Locations of the six dry wells would be confirmed prior to construction to determine the potential for encountering hydrocarbon-impacted soil.

Although there are no identified contaminant sites with the project construction area, excavation, trenching, and other ground-disturbing activities during project construction could disturb previously unidentified contaminated soil or encounter contaminated groundwater. If contamination is present, ground-disturbing activities during construction could result in a potential safety and health hazard through the spread of materials in dust.

The conveyance pipeline would cross under a PG&E natural gas pipeline and 9,000 feet of petroleum pipeline within the reservoir footprint must be relocated. Because the conveyance pipeline crossing Interstate 5 would be constructed using trenchless technology, no conflict with the natural gas pipeline is expected. Once construction of the relocated petroleum pipeline is completed, the existing pipeline would be shut down and then removed in accordance with federal, state and local standards. This would include proper sampling and clean-up of any potentially contaminated soil that may be encountered during excavation of the pipeline.

Operation Impacts

Operation and maintenance of the pumping plant and inlet/outlet works would require the limited use of hazardous and non-hazardous materials, such as lubricants, degreasers, and solvents as part of routine maintenance. These materials would be properly transported, stored, managed and disposed of in accordance with federal, state and local regulations, thus impacts would be less than significant.

<u>Significance before Mitigation</u>

Construction impacts of the project are potentially significant as the project may create a hazard to the public or environment through accident conditions involving the release of hazardous materials during construction of project components, relocation of utilities, and construction near abandoned oil wells. With adherence to the applicable federal and state regulatory requirements for the safe removal of the old pipeline, and proper design, installation and testing of the relocated petroleum pipeline, the risk of accidental release is anticipated to be less than significant. Although the Project would not involve construction in any identified contaminant sites, it is possible that construction could encounter previously unidentified contaminants typical of the project area including soils that have been affected by ongoing operation of oil wells. Disturbance of contaminated soil is potentially significant. The following mitigation measures are included to address potential impacts:

Mitigation Measures

Mitigation Measure HAZ-1a: Hazardous Materials Management and Spill Control Plan

Before construction begins, the Project Partners shall require all construction contractors to develop and implement a Hazardous Materials Management and Spill Control Plan (HMMSCP) that includes project-specific contingency plan for hazardous materials and waste operations, including management of contaminated soil. The HMMSCP shall be reviewed and approved by Project Partners and shall establish policies and procedures consistent with applicable codes and regulations, including but not limited to the California Building and Fire Codes, as well federal OSHA and Cal/OSHA regulations. Any substance defined by the California Accidental Release Program as extremely hazardous would also require preparation of a Risk Management Plan. Elements of the HMMSCP shall include, but not be limited to the following:

- A discussion of hazardous materials management, including delineation of hazardous material storage areas, access and egress routes, waterways, emergency assembly areas, and temporary hazardous waste storage areas;
- Notification and documentation of procedures; and
- Spill control and countermeasures, including employee spill prevention/response training.

Mitigation Measure HAZ-1b: Preparation of Hazardous Materials Business Plan

If project operations involve the use, handling or storage of hazardous materials in excess of threshold quantities, prior to operation of the new facilities, Project Partners shall prepare and implement a Hazardous Materials Business Plan (HMBP) for the proposed project. The plan shall be prepared in accordance with the Hazardous Materials Business Plan Program (California Health and Safety Code, Section 25500, et seq., and the related regulations in CCR Title 19 Section 2620, et seq.), and shall be filed with the California Environmental Reporting System. The HMBP shall include a hazardous materials inventory, site plan, an emergency response plan, and requirements for employee training.

Mitigation Measure HAZ-1c: Implement Avoidance and Minimization Measures for Impacts Related to the Abandoned Oil Wells

During the project design phase, Project Partners shall verify exact locations of all wells where project construction would disturb the soil above the well location and shall mark the locations of wells for future reference. Special attention shall be paid to Wells 3 and 6, which are potentially located in the footprint of the reservoir inundation area and roadway realignment, respectively. For any well that is outside the project footprint but within 100 feet of the proposed construction area, Project Partners shall impose a 10-foot, no-build buffer zone around the well. If any wells are within the area that would be affected by construction or operation of the project. Project Partners shall determine if avoidance is feasible, and if the avoidance is not possible, **Mitigation Measure HAZ-1d** shall be implemented**.**

Mitigation Measure HAZ-1d: Management of Abandoned Oil Wells

For any wells determined to be within the proposed footprint of project facilities, Project Partners shall work with the ~~Division of Oil, Gas, and Geothermal Resources (DOGGR)~~ <u>California Geologic Energy Management Division (CalGEM)</u> to ensure that any abandoned well within the inundation area of the Del Puerto Canyon Reservoir is abandoned to current standards. ~~DOGGR~~ <u>CalGEM</u> will conduct a lease and site inspection for the well. If the well is determined to be hazardous it shall be re-abandoned to current standards. If any unknown wells are discovered during project construction ~~DOGGR~~ <u>CalGEM</u> shall be notified immediately. Work on abandoned wells shall be permitted and approved by CalGEM ~~DOGGR~~, including any modifications, re-abandonment, or mitigation of leaking fluids or gas. Project Partners shall communicate pertinent information from CalGEM ~~DOGGR~~ to the appropriate county recorder for inclusion in the title information of the subject real property. Physical access to any abandoned well shall be maintained in the event re-abandonment becomes necessary in the future. Rig access shall be maintained to allow a well servicing rig and associated necessary equipment to reach the well without disturbing the surrounding infrastructure. Requirements for physical access shall be considered during design and shall be coordinated with CalGEM ~~DOGGR~~.

Mitigation Measure HAZ-1e: Soil Sampling and Disposal

Prior to acquiring property or obtaining easements for construction of project facilities, Project Partners shall complete a Phase I Environmental Site Assessment for soil and groundwater contamination and potential hazardous materials in structures. The recommendations set forth in the Phase I assessment shall be implemented to the satisfaction of applicable agencies before construction begins. If Phase I assessments indicate the potential for contamination, a Phase II Environmental Site Assessment shall be completed before construction begins. The Phase II assessment may include building material, soil and/or groundwater sampling and analysis for any anticipated contaminants. If the Phase I assessment identifies potential presence of contamination from agricultural activities, the Phase II Assessment would include evaluation of abandoned orchards to test for the presence of organochlorine pesticides (OCPs) in accordance with DTSC's Interim Guidance for Sampling Agricultural Properties. The Phase II sampling is intended to identify how to dispose of any potentially harmful material from excavations, and to determine if construction workers need specialized personal protective equipment while constructing the pipeline through that area. Contaminated soil will not be reused for backfill following excavation. If soil or groundwater contaminated by potentially hazardous materials is exposed or encountered during construction that was not identified in the Phase I assessment, the appropriate hazardous materials agencies shall be notified. If contaminated soils must be excavated and removed from the site, the removal of contaminated soil would be subject to the measures described under **Mitigation Measure HAZ-1a**.

Significance after Mitigation

Implementation of the practices outlined in the mitigation measures above would ensure potential impacts related to the accidental release of hazardous materials or disturbance of contaminated soil would remain less than significant. Impacts related to abandoned oil wells would be avoided through project redesign or re-abandonment. Additionally, impacts related to the removal and relocation of the petroleum pipeline would be avoided by following proper procedures, thus resulting in impacts that would be less than significant.

Cumulative Impact Analysis

The geographic scope of the cumulative impacts related to hazards and hazardous materials is the project site and immediate surrounding area. If the proposed project, as well as other projects listed in **Table 3.0-1**, result in similar impacts associated with the accidental release of chemicals and exposure to public and the environment, they could result in significant cumulative impacts and increase the risk of hazards. The following projects were identified as having a potential nexus with the project:

- City of Patterson Water Master Plan: evaluated 13 water supply options, including a stormwater capture project to recharge 1,700 acre-feet of water from Del Puerto Creek.
- San Luis Transmission Project: new high voltage transmission line adjacent to existing transmission line corridor.

Cumulative projects may use hazardous materials during construction activities and thus may present a similar risk of accidental release of chemicals and exposure to the public and the environment. In addition, construction could overlap and thus increase the risk of hazards. However, with the implementation of Mitigation Measures HAZ-1a, through HAZ 1e, the project's contribution to these cumulative impacts would not be cumulatively considerable. Thus, the project's contribution to cumulative impacts would be less than cumulatively significant.

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3.11 Hydrology and Water Quality

This section presents the physical and regulatory setting for hydrology and water quality for the proposed project. Information in this section was developed using an operations model for the reservoir that was developed for the proposed project (Woodard & Curran 2019 Operations Analysis, see **Appendix F)**, which also summarizes CalSim modeling data that was used in the analysis.

3.11.1 Environmental Setting

The following sections describe the environmental setting for hydrology and water quality in proximity to the project site. For the purposes of this section, the project area refers to the potential footprint of the proposed project including all construction areas, staging areas, utility realignments, access roads, and areas that would be temporarily or permanently disturbed. This section also evaluates effects on the Delta-Mendota Canal (DMC), San Luis Reservoir, Del Puerto Creek downstream of the reservoir and the San Joaquin River downstream of Del Puerto Creek.

Hydrology

The proposed project is located in the San Joaquin Valley, which is characterized by cool, wet winters and dry, warm summers. The majority of the annual precipitation occurs from December through April, with an average of approximately 11 inches of rainfall per year.

Surface Water

The project area is located within the San Joaquin River Basin (Basin). The Basin covers 15,880 square miles, with its major river systems consisting of the San Joaquin River and its larger tributaries, the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno rivers (CVRWQCB 2016). The surface water bodies potentially affected by the proposed project include Del Puerto Creek, the San Joaquin River, the Delta-Mendota Canal, and the San Luis Reservoir.

Del Puerto Creek

Del Puerto Creek, an intermittent creek that runs through the project area, is a tributary of the San Joaquin River, draining the eastern slopes of the Diablo Range. The creek is located in the Lower Del Puerto Creek sub-watershed and flows into the San Joaquin River, which eventually flows to the Sacramento – San Joaquin Delta. The watershed for the creek is 47,493 acres. Flows in Del Puerto Creek are currently measured and recorded at United States Geological Survey (USGS) gaging station 11274630, which is located approximately 1,000 feet upstream of where the creek flows under Interstate 5. Data for the gaging station include annual peak flow measurements dating back to 1959, average daily flow measurements extending back to June 1965, and 15-minute flow measurement extending back to October 2007. Annual peak historic flows are shown in **Table 3.11-1**.

Table 3.11-1: Historic Flows in Del Puerto Creek[1]

Description	Minimum	Mean	Maximum
Peak flow (cfs)	2	373	5,270
Annual stormwater runoff (acre-feet)	21	4,624	34,688

[1] Data from USGS Gaging Station 11274630

~~Woodard & Curran 2019. DPCR Operations Analysis Technical Memorandum, November 2019.~~

Del Puerto Creek does not have a specific beneficial use designation defined in *The Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin (Basin Plan)* prepared by the California Regional Water Quality Control Board Central Valley Region. In accordance with the Basin Plan, since Del Puerto Creek is a tributary to the San Joaquin River, beneficial uses of Del Puerto

Creek are assumed to be the same as the San Joaquin River. Existing beneficial uses thus are municipal and domestic supply, irrigation, stock watering, industrial process water, contact and non-contact recreation, warmwater habitat, warmwater and coldwater fish migration, warmwater spawning and wildlife habitat.

San Joaquin River

The 366-mile San Joaquin River starts in the high Sierra Nevada and flows in a northerly direction to the Sacramento – San Joaquin Delta. Existing beneficial uses of the San Joaquin River, downstream of the confluence of Del Puerto Creek, are municipal and domestic supply, irrigation, stock watering, industrial process water, contact and non-contact recreation, warmwater habitat, warmwater and coldwater fish migration, warmwater spawning and wildlife habitat.

Delta-Mendota Canal

The DMC is a Central Valley Project (CVP) facility operated and maintained by the San Luis and Delta-Mendota Water Authority under contract with the United States Bureau of Reclamation (Reclamation or USBR). The 117-mile concrete-lined canal begins at the C.W. Bill Jones Pumping Plant (formerly named the Tracy Pumping Plant), which pumps water from the Sacramento-San Joaquin Delta. The canal runs south along the western edge of the San Joaquin Valley, parallel to the California Aqueduct for much of its length, but diverges to the east after passing San Luis Reservoir, which receives a portion of its water from the DMC (the remaining portion of water flowing into San Luis Reservoir comes from the California Aqueduct). The water is pumped from the canal into O'Neill Forebay, and then is pumped into San Luis Reservoir by the Gianelli Pumping- Generating Plant. Water from San Luis Reservoir is released through O'Neill Forebay and into the DMC, the San Felipe Division of the CVP, and the California Aqueduct. The DMC ends at the Mendota Pool, a small reservoir created by Mendota Dam on the San Joaquin River near the town of Mendota, approximately 30 miles west of Fresno.

Existing beneficial uses identified in the Basin Plan are warm freshwater habitat, irrigation, wildlife habitat, stock watering, recreation, municipal/industrial use, and noncontact use. The DMC has an inter-connection to the California Aqueduct via an intertie located west of the City of Tracy (USBR 2013) and connects with the SWP at O’Neill Forebay.

Reclamation has historically accepted non-project water in the DMC to supplement the supply of CVP water. This water is primarily from wells located along the canal, as well as surface water pumped from the San Joaquin River. The DMC also receives recycled water delivered to the DMC from the City of Modesto’s Jennings Wastewater Treatment Plant, and soon from the City of Turlock’s Regional Water Quality Control Facility as part of the North Valley Regional Recycled Water Program (NVRRWP), for use by Del Puerto Water District and south of delta wildlife refuges.

San Luis Reservoir

The DMC is connected to the San Luis Reservoir via O’Neill Forebay midway along the length of the canal. The 2 million-acre-feet San Luis Reservoir is an artificial lake on San Luis Creek in the eastern slopes of the Diablo Range of Merced County that is jointly owned and operated by Reclamation and the California Department of Water Resources (DWR) and is one of California's largest reservoirs (SCVWD, 2013). San Luis Reservoir serves to store CVP and State Water Project (SWP) water for later release and delivery to CVP and SWP contractors.

100-Year Floodplain in Vicinity of Patterson

Downstream of the proposed project, between the California Aqueduct and San Joaquin River, are multiple Special Flood Hazard Areas, as identified by the Federal Emergency Management Agency (FEMA). **Figure 3.11-1** shows the FEMA Special Flood Hazard Areas. As shown on the flood hazard map, in the 100-year flood event portions of the City of Patterson are subject to flooding.

Figure 3.11-1: City of Patterson Flood Insurance Rate Map

Source: FEMA, 2008

Table 3.11-2 shows designations of Special Flood Hazard Areas identified in **Figure 3.11-1** and the corresponding descriptions.

Table 3.11-2: FEMA Flood Zones

Special Flood Hazard Area	Description
Zone A	1-percent annual chance of flood, determined by approximate methods of analysis
Zone AE	1-percent annual chance of flood, determined by detailed methods of analysis
Zone AO	1-percent chance of shallow flooding (sheet flow on sloping terrain)
Zone X	Outside of floodplain

Groundwater

Portions of the proposed project area, including the pump station and pipeline, overlie the Delta-Mendota Subbasin and are located within the Northwestern Delta-Mendota Groundwater Sustainability Area jurisdiction. Groundwater in the subbasin is in two aquifers, a lower confined zone and an upper unconfined zone separated by the thick, semi-impermeable Corcoran Clay layer. The proposed dam and reservoir are located outside of the Delta-Mendota Subbasin. In general, groundwater quality in the lower aquifer of the Delta-Mendota Subbasin is suitable for most urban and agricultural uses. However, water in the upper aquifer has high levels of TDS and nitrate that make the water unsuitable for potable use. There are localized areas where groundwater quality is also impaired with high chloride, boron, iron, and manganese (DWR 2003).

Water Quality

Del Puerto Creek

Although water quality data is not available, the upper reaches of Del Puerto Creek are assumed to be of generally high quality. Lower reaches are impaired by runoff from adjacent agricultural practices.

San Joaquin River

Water quality in the San Joaquin River is generally acceptable for its established beneficial uses, though the river is affected by salts and nutrients from wastewater discharges and adjacent agricultural practices.

Delta-Mendota Canal

The Delta-Mendota Canal Non-Project Water Pump-in Program Monitoring Plan (USBR 2018) provides requirements on water quality of non-project water before it is pumped back to the CVP. Non-Project water means surface or groundwater that is pumped, diverted, and/or stored based upon the exercise of water rights for a Reclamation project (USBR 2018). The quality of water must meet the standards listed in **Table 3.11-3** and **Table 3.11-4** prior to pumping into the DMC.

Water pumped into the DMC must be sampled for the constituents listed in **Table 3.11-3** every week for the first four weeks, followed by monthly sampling for the duration of pumping.

Every three years the non-project source is required to be sampled for the full suite of Title 22 constituents. Any discharger of non-project water with out-of-date analysis is not allowed to discharge until laboratory data is updated. **Table 3.11-4** shows the full list of Title 22 water quality standards for acceptance of non-project water into the DMC.

Table 3.11-3: Water Quality Standards to Pump into DMC[1]

Constituent	Units	Maximum Contaminant Level
Arsenic	mg/L	0.01
Boron	mg/L	0.7
Nitrate (as N)	mg/L	10
Selenium	mg/L	0.002
Sodium	mg/L	69
Specific Conductance	uS/cm	1,600
Sulfate	mg/L	500
Total Dissolved Solids	mg/L	1,000

(1) *Delta-Mendota Canal Non-Project Water Pump-in Program Monitoring Plan* (Reclamation, 2018) Table 1.

Table 3.11-4: Title 22 Water Quality Standards to Pump into DMC[1]

Constituent	Units	Maximum Contaminant Level
Primary		
Aluminum	mg/L	1
Antimony	mg/L	0.006
Arsenic	mg/L	0.010
Asbestos	MFL	7
Barium	mg/L	1
Beryllium	mg/L	0.004
Cadmium	mg/L	0.005
Chromium, total	mg/L	0.05
Cyanide	mg/L	0.15
Fluoride	mg/L	2.0
Mercury	mg/L	0.002
Nickel	mg/L	0.1
Nitrate (as N)	mg/L	10
Nitrate + Nitrite	mg/L	10
Nitrite (as N)	mg/L	1
Perchlorate	mg/L	0.006
Selenium	mg/L	0.002
Thallium	mg/L	0.002
Secondary		
Aluminum	mg/L	0.2
Color	units	15
Copper	mg/L	1.0
Foaming Agents (MBAS)	mg/L	0.5
Iron	mg/L	0.3

Constituent	Units	Maximum Contaminant Level
Manganese	mg/L	0.05
Methyl-tert-butyl ether (MTBE)	mg/L	0.013
Odor -threshold	units	3
Silver	mg/L	0.1
Thiobencarb	mg/L	0.001
Turbidity	units	5
Zinc	mg/L	5
Other Required Analysis		
Boron	mg/L	0.7
Lead	mg/L	0.015
Molybdenum	mg/L	0.01
Sodium	mg/L	69
Radioactivity		
Gross Alpha	pCI/L	15
Organic Chemicals		
Benzene	mg/L	0.001
Carbon tetrachloride	mg/L	0.0005
1,2-Dichlorobenzene	mg/L	0.6
1,4-Dichlorobenzene	mg/L	0.005
1,1-Dichloroethane	mg/L	0.005
1,2-Dichloroethane	mg/L	0.0005
1,1-Dichloroethylene	mg/L	0.006
Cis-1,2-dichloroethylene	mg/L	0.006
Trans-1,2-dichloroethylene	mg/L	0.01
Dichloromethane	mg/L	0.005
1,2-Dichloropropane	mg/L	0.005
1,3-Dichloropropene	mg/L	0.0005
Ethylbenzene	mg/L	0.3
Methyl-tert-butyl ether	mg/L	0.013
Monochlorobenzene	mg/L	0.07
Styrene	mg/L	0.1
1,1,2,2-Tetrachloroethane	mg/L	0.001
Tetrachloroethylene (PCE)	mg/L	0.0005
Toluene	mg/L	0.15
1,2,4-Trichlorobenzene	mg/L	0.005
1,1,1-Trichloroethane	mg/L	0.200
1,1,2-Trichloroethane	mg/L	0.005
Trichloroethylene		0.005
Trichloroflouromethane	mg/L	0.15

Constituent	Units	Maximum Contaminant Level
1,1,2-Trichloro-1,2,2-Trifluoroethane	mg/L	1.2
Vinyl Chloride	mg/L	0.0005
Xylenes	mg/L	1.750
Alachlor	mg/L	0.002
Atrazine	mg/L	0.001
Bentazon	mg/L	0.018
Benzo(a)pyrene	mg/L	0.0002
Carbofuran	mg/L	0.018
Chlordane	mg/L	0.0001
2,4-D	mg/L	0.07
Dalapon	mg/L	0.2
Dibromochloropropane	mg/L	0.0002
Di(2-ethylhexl)adipate	mg/L	0.4
Di(2-ethylhexyl)phthalate	mg/L	0.004
Dinoseb	mg/L	0.007
Diquat	mg/L	0.02
Endothall	mg/L	0.1
Endrin	mg/L	0.002
Ethylene dibromide	mg/L	0.000005
Glyphosate	mg/L	0.7
Heptachlor	mg/L	0.00001
Heptachlor epoxide	mg/L	0.00001
Hecachlorobenzene	mg/L	0.001
Hexachlorocyclopentadiene	mg/L	0.05
Lindane (gamma-BHC)	mg/L	0.0002
Methoxychlor	mg/L	0.03
Molinate	mg/L	0.02
Oxamyl	mg/L	0.05
Pentachlorophenol	mg/L	0.001
Picloram	mg/L	0.5
Polychlorinated biphenyls	mg/L	0.0005
Simazine	mg/L	0.004
Thiobencarb (Bolero)	mg/L	0.07
Toxaphene	mg/L	0.003
1,2,3-Trichloropropane	mg/L	0.000005
2,3,7,8-TCDD (Dioxin)	mg/L	$3x10^{-8}$
2,4,5-TP (Silvex)	mg/L	0.05

(1) *Delta-Mendota Canal Non-Project Water Pump-in Program Monitoring Plan* (USBR, 2018) Table 2.

Harmful Algal Blooms

Cyanobacteria are aquatic, photosynthetic bacteria that occur in freshwater as well as saline environments. Cyanobacteria commonly are present in low abundance in lakes and reservoirs (Graham et al. 2008). Some species of cyanobacteria produce toxins (cyanotoxins), which can adversely affect humans, domestic animals, fish and other wildlife. Most toxin-producing cyanobacteria are freshwater species; however, studies have shown that freshwater cyanobacteria have a relatively broad range of salinity tolerance (Berg and Sutula 2015). When toxic cyanobacteria grow out of control, these masses of overgrowth are referred to as “harmful algal blooms” or “HABs”. Of the toxin-producing cyanobacteria, *Microcystis aeruginosa* is one of the most common worldwide; *Microcystis* species produce the cyanotoxin microcystin. Human exposure to cyanotoxins in freshwater most commonly occurs during recreational activities (e.g., swimming, boating) through direct contact, or by breathing in aerosolized toxins near a contaminated water body.

Cyanotoxins typically remain within cyanobacteria until the cyanobacteria die or rupture, at which point the toxins are released; however, toxins can be actively released from living cyanobacteria as well (Graham et al. 2008). Cyanotoxins, once released, eventually undergo biodegradation and, to a small extent, photodegradation (Gagala and Mankiewicz-Boczek 2012). *Microcystins*, for example, can be rapidly degraded (hours to days) by microbes in sediment (Berg and Sutula 2015; Gagala and Mankiewicz-Boczek 2012; Kormas and Lymperopoulou 2013). *Microcystins* are relatively stable in the environment. In addition to toxin production, HABs can affect water quality by reducing dissolved oxygen. The decomposition of HABs by bacteria is an oxygen-consuming process, which reduces dissolved oxygen in the surrounding surface water.

Most HABs in California occur in spring to fall (roughly May to October) but blooms can begin earlier or continue year-round in some locations. In inland waters, the occurrence of HABs is increasing (Interagency Working Group on Harmful Algal Bloom Related Illnesses 2019). No single environmental factor causes the formation and maintenance (i.e., persistence) of HABs. Generally, HABs are dependent on water temperature of at least approximately 66 degrees Fahrenheit, water column sunlight (known as irradiance), low turbidity, a calm, stratified water column coupled with long water residence times, and the availability of dissolved nutrients (specifically nitrogen and phosphorus) in non-limiting concentrations (USEPA 2016a; Lehman et al. 2013; Berg and Sutula 2015). Whereas water temperature exceeding approximately 66 degrees Fahrenheit and irradiance are generally considered the primary drivers of bloom initiation, low flow and long water residence time may be the primary factor for maintaining HABs (Berg and Sutula 2015; Lehman et al. 2013).

Light and Turbidity

Cyanobacteria are photosynthetic and therefore are dependent on adequate light for growth. Many cyanobacteria grow relatively poorly at low and mixed light levels, such as occur deeper in the water column, but grow very well when exposed to high light (Berg and Sutula 2015). Generally, in stratified lakes or reservoirs, cyanobacteria accumulate near the water’s surface as well as distribute throughout the photic zone, an upper water layer where light is still sufficient for photosynthesis (Graham et al. 2008). Growing close to the water’s surface also aids cyanobacteria in avoiding any light limitation due to high turbidity (Berg and Sutula 2015). In shallow lakes or reservoirs, where light penetrates to the bottom, the photic zone extends to the maximum depth of the lake/reservoir. Reservoir-wide surface distribution of cyanobacteria is influenced by reservoir morphology and hydrology. HABs can be evenly or irregularly distributed in reservoirs and lakes according to water currents and prevailing winds, and the spatial distribution can change rapidly if circulation patterns change or with reservoir inflow events (Graham et al. 2008).

Water Temperature

In addition to driving bloom formation, elevated water temperature is also a key factor in controlling the magnitude and duration of *Microcystis* blooms (Lehman et al. 2017). Growth rates of cyanobacteria increase with increasing water temperature, and in temperate climates, growth is optimal between 77 degrees Fahrenheit and 95 degrees (Berg and Sutula 2015). Further, elevated surface water temperature can intensify stratification of the water column, which increases *Microcystis* biomass by maintaining the cyanobacteria colonies in the water's surface layer where light stimulates photosynthesis (Paerl and Paul 2012). In freshwater systems (e.g., a lake), stratification tends to occur in spring and is maintained throughout summer. In reservoirs, drought conditions typically result in increased reservoir drawdowns in summer, which results in increased residence time, increased water column nutrient concentrations, and increased water temperatures (Bakker and Hilt 2016).

Nutrients

Nitrogen and phosphorus are the two nutrients that control cyanobacteria production. Provided that optimal temperature and light conditions are present, cyanobacterial biomass accumulation is directly proportional to the concentration of nitrogen and phosphorus available in the water column (Berg and Sutula 2015). In other words, if nitrogen and phosphorus are not available, this may limit bloom duration and intensity, as well as the geographical distribution of blooms (Berg and Sutula 2015).

There is no water body in the Central Valley that is 303(d) listed as impaired for microcystin or any other cyanotoxin. However, *Microcystis* blooms have been recorded in the Sacramento-San Joaquin Delta (Delta) since 1999 (Van Wichelen et al. 2016; Mioni et al. 2012), as well as in multiple lakes and reservoirs throughout the Central Valley, including Lake Oroville, San Luis Reservoir and O'Neill Forebay (USEPA 2016b and 2019a; Central Valley Regional Water Quality Control Board and California State Parks 2016).

HABs can form due to low reservoirs levels, which generally result in higher water temperatures, particularly in the summer months (USEPA 2013). Generally, low reservoir levels can result in large shallow areas, reduced mixing between warmer and cooler strata, and thus a more stable water column, in addition to higher water temperatures, all of which may increase the formation HABs. There is an increase potential of water quality degradation (cyanobacteria and cyanotoxins) of reservoir withdrawals as the surface water and upper water strata are drawn closer to the elevation of the reservoir outlet(s). In San Luis Reservoir, for example, conditions (high temperatures and declining water levels) promote growth of reservoir-wide algae during the summer months and/or drought periods as the reservoir is drawn down. When San Luis Reservoir is drawn down to the "low point" (approximately 369 feet above mean sea level and 300 thousand acre-feet [TAF] of water in storage), or lower, water cannot be exported for municipal and industrial purposes to Santa Clara Valley Water District. This is because algae from the reservoir is drawn into San Felipe Division intake and is often not suitable for agricultural water users with drip irrigation systems (USBR 2013). San Luis Reservoir's minimum operating level is about 30 feet above the top of Giannelli Intake. Therefore, algae do not typically enter the DMC or the California Aqueduct at that point (USBR 2011).

The Delta is not on the 303(d) list for nutrients and temperature, which are important variables in driving and maintaining HABs. However, the U.S. Environmental Protection Agency (USEPA) has recently recommended additions to the 303(d) list for water temperature impairments, including areas in the Delta (USEPA 2018). Nutrients in the Delta originate from point and nonpoint sources. Municipal wastewater and stormwater are common sources of nutrients to the Delta, and agricultural drainage is a source of nutrients to the Delta (USEPA and Central Valley Drinking Water Policy Workgroup 2006). Nitrogen and phosphorus are available in non-limiting amounts in the Delta, and concentrations, or ratios (nitrogen:phosphorus) do not change sufficiently annually to account for year-to-year variation in Microcystis biomass or occurrence in the Delta (Berg and Sutula 2015). Nitrogen and phosphorus availability may limit bloom duration and intensity, as well as the geographical distribution of blooms (Berg and Sutula 2015).

3.11.2 Regulatory Framework

This section describes laws and regulations at the federal, state, and local level that may apply to the project.

Federal Policies and Regulations

Clean Water Act

Originally titled the Federal Water Pollution Control Act of 1972, the Clean Water Act (CWA) is administered by USEPA. The CWA allowed USEPA to delegate the National Pollutant Discharge Elimination System (NPDES) Permit Program to state governments, enabling states to perform many of the permitting, administrative, and enforcement aspects of the NPDES Program. In California, these functions are performed by the by the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs). The CWA serves as the primary federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. The Central Valley Regional Water Quality Control Board (CVRWQCB) has jurisdiction over the proposed project area.

Section 303(d)

CWA Section 303(d) requires states to develop lists of water bodies that will not attain water quality standards after implementation of technology-based effluent limitations by point-source dischargers. Section 303(d) further requires states to develop a Total Maximum Daily Load (TMDL) for each of the listed pollutants and water bodies. A TMDL is the amount of pollutant loading that the water body can receive and still meet water quality standards.

In 2016, the USEPA gave final approval to a revised list of impaired water bodies (hereinafter referred to as the 303(d) list) prepared by the State. Del Puerto Creek, between the DMC and confluence with the San Joaquin River, is listed for several constituents, specified below. The San Joaquin River is listed for several constituents and TMDLs have been approved for some constituents including specific organic pesticides, salt, chlorpyrifos, and boron (SWRCB 2010). The DMC is not on the 303(d) list.

The SWRCB and RWQCBs assesses water quality data for California's surface waters every two years to determine if they contain pollutants at levels that exceed protective water quality criteria. The biennial assessment is required under Section 303(d) of the CWA.

Del Puerto Creek, as it flows through the proposed Project area, is not listed on the 303(d) list. Del Puerto Creek, between the DMC and San Joaquin River, is listed on the 303(d) list for the following pollutants:

- Bifenthrin
- Chlorpyrifos
- Cyfluthrin
- Cyhalothrin, Lambda
- Diazinon
- Dieldrin
- Diuron
- Esfenvalerate/Fenvalerate
- Indicator Bacteria
- Nitrate + Nitrite (as N)

- pH (high)
- Pyrethroids
- Salinity
- Total Dissolved Solids (TDS)
- Toxicity

TMDLs have not been established for the above 303(d)-listed pollutants (SWRCB 303(d) List, 2014-2016).

Section 401

Section 401 of the CWA allows for evaluation of water quality when a proposed activity requiring a federal license or permit could result in a discharge to waters of the U.S. Compliance with Section 401 is required for all projects that have a federal component and may affect water quality. See *Chapter 3.4, Biological Resources* for further discussion of CWA Section 401.

Section 402

Section 402 of the CWA specifically required USEPA to develop and implement the NPDES program. In California, USEPA authorizes the SWRCB to oversee the NPDES program through the RWQCBs. There are several types of NPDES permits relevant to the proposed project.

General Permit for Discharges of Storm Water Associated with Construction Activity

In 2009, the SWRCB adopted an amended *General Permit for Discharges of Storm Water Associated with Construction Activity,* NPDES Order No. CAS000002, Order No. 2009-0009-DWQ (Construction General Permit). Effective July 1, 2010, the amended General Construction Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP and monitoring program for construction projects that result in one or more acres of land disturbance. The SWPPP must identify Best Management Practices (BMPs) that will be implemented during construction to control pollutants in stormwater discharges from the construction site; a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment (Note: The San Joaquin River is not 303(d) listed for sediment.). Because the proposed project would disturb more than one acre, coverage under the General Construction Permit would be required and one or more SWPPPs would be developed and implemented for the various components of the project.

Waste Discharge Requirements for Dewatering and Other Low Threat Discharges to Surface Waters

On May 31, 2013, the CVRWQCB adopted *Waste Discharge Requirements for Dewatering and Other Low Threat Discharges to Surface Waters,* Order R5-2013-0074 NDPES No. CAG995001 (General Order for Dewatering). Individuals, public agencies, private businesses, and other legal entities discharging relatively pollutant-free wastewaters that pose little or no threat to the quality of surface waters, for a duration of either four months or less in duration or have an average dry weather flow less than 0.25 million gallons per day (mgd), may obtain authorization under this General Order to discharge. This General Order covers certain categories of dewatering and other low threat discharges to waters of the United States, which are either four months or less in duration or have a daily average discharge flow that does not exceed 0.25 mgd. It is expected that dewatering would not exceed 0.25 mgd and that the proposed project would be eligible for coverage under the General Order. If dewatering were to exceed 0.25 mgd, an alternative NPDES permit would be needed in order to discharge water from dewatering operations. This same permit would be expected to cover discharges that would be required for hydrostatic testing of the pipeline at the completion of construction.

Section 404

CWA Section 404 regulates the discharge of dredged and fill materials into waters of the United States. Areas meeting the regulatory definition of waters of the U.S. are subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE) under provisions of CWA Section 404. Construction activities involving placement of fill into jurisdictional waters of the U.S. are regulated by the USACE through Section 404 permits. No USACE permit is effective in the absence of state water quality certification pursuant to Section 401 of the CWA. Also, see *Chapter 3.4, Biological Resources* for further discussion of CWA Section 404.

National Flood Insurance Program

NFIP was created to promote flood awareness and reduce flood losses of properties within Special Flood Hazard Areas. Drainage and related flooding hazards are managed in response to requirements established by the National Flood Insurance Act of 1986 and the Flood Disaster Protection Act of 1973, as amended. Requirements of the NFIP are included in the Building Code and through overall City and interagency programs for flood management. In implementing NFIP, FEMA requires that new construction in a flood hazard area meet minimum design standards to place occupied structures above flood hazard areas. FEMA publishes flood inundation maps indicating areas prone to a 100-year flood event, and portions of the City of Patterson and surrounding areas are in the current 100-year inundation area from floods on Del Puerto Creek.

Reclamation Guidelines for Accepting Non-Project Water into the DMC

In the *Delta-Mendota Canal Non-Project Water Pump-in Program Monitoring Plan* (USBR 2018), Reclamation has established guidelines for accepting non-project water in the DMC. Specifically, such water must meet water quality standards before introduction to the canal; (i.e., dilution in the canal is not considered in determining whether non-project water meets water quality standards), and non-project water must not cause alterations of existing water quality parameters outside of standards established by the guidelines. The current water quality standards for non-project surface water are based on statewide domestic water quality regulations and are listed in the January 2018 Monitoring Plan. Similar to the 2014 Monitoring Plan, the 2018 monitoring plan will measure changes in the quality of water in the DMC caused by the introduction of the non-project surface water and confirm that the blended water is suitable for downstream water users.

Coordinated Operation Agreement

The Coordinated Operation Agreement (COA), signed in 1986, is an agreement between the State of California (represented by the Department of Water Resources (DWR) and the federal government (represented by Reclamation). The purpose of the COA is to coordinate the operations of the CVP and the SWP. The COA defines each project’s responsibility to protect other beneficial uses of water and defines the sharing of excess water between the projects.

The procedure for sharing responsibility for demands and for sharing excesses of water is defined under two conditions: balanced water conditions and excess water conditions. Balanced water conditions occur when upstream releases plus unregulated flows equal the water supply needed to meet in-basin uses plus CVP and SWP Delta diversions, which include withdrawals under CVP and SWP water right permits at the Jones (formerly Tracy) Pumping Plant, the Banks Pumping Plant, the Contra Costa Canal Pumping Plant #1, and the North Bay Aqueduct. Excess water conditions occur when upstream releases plus unregulated flows exceed the water supply needed to meet in-basin uses plus SWP and CVP Delta diversion.

The COA stipulates that the CVP and SWP will coordinate responsibility for meeting Sacramento Valley in-basin use and for sharing any un-stored water for export. When stored water is needed for in-basin use then the CVP agrees to provide 75 percent of the water necessary to meet the standard while the SWP provides the remaining 25 percent. If un-stored water is available for export, then the CVP is entitled to use 55 percent of the excess available water and the SWP is entitled to the remaining 45 percent. Any water that is not used by one project is available for use by the other project, or it flows out of the Delta as surplus. These rules were established to account for meeting SWRCB Decision 1485. Subsequent changes to the Water Quality Control Plan have resulted in modifications to these rules by mutual agreement between Reclamation and DWR.

In December 2018 Reclamation and DWR agreed to amend four elements of the COA to reflect how the CVP and SWP have evolved since the original COA was authorized (Reclamation Addendum 2018). The four proposed changes to the COA are:

1) Sharing responsibility between Reclamation and DWR for meeting Sacramento Valley in-basin use with storage withdrawals during balanced water conditions
2) Adding that DWR will transport up to 195,000 AF of CVP water through the California Aqueduct no later than November 30 of each year at times those diversions do not adversely affect the SWP purposes or do not conflict with SWP contract provisions
3) Sharing export capacity between Reclamation and DWR when exports from the Delta are constrained
4) Prior to initiation of operation of a new or significantly modified Reclamation or DWR facility, Reclamation and DWR shall jointly review the operations of both projects.

The Project Partners receive water from the DMC through contracts with Reclamation. Del Puerto Water District purchases water from the Bureau of Reclamation pursuant to a water service contract. The member entities of the San Joaquin River Exchange Contractors Water Authority are party to two contracts with the United States: a Purchase Contract and an Exchange Contract. Under the Purchase Contract, the Exchange Contractors sold their so called “High Flow” San Joaquin River water rights to the United States, except for ‘reserved water,’ water to which the Exchange Contractors hold vested rights. Simultaneously, under the Exchange Contract, the Exchange Contractors agreed not to exercise their rights to the San Joaquin River, so long as they receive certain volumes of substitute water. The Exchange Contract contemplates that most if not all of the substitute water provided to the Exchange Contractors will be delivered to them via the Delta - Mendota Canal. Contracted water amounts determine quantities of supply that DPWD receives each year from Reclamation. Actual deliveries to DPWD have been as low as zero in two years during the most recent drought. (Hansen 2019). The Exchange Contractors have a contractual water allotment of 840,000 AF, but in critical years the allocation is reduced to 75 percent, or 650,000 AF (USBR 1967, USBR 1939). However, during critical years the Exchange Contactors supply was reduced to 75 percent in 1991, 1992, and 1994, and down to 61 percent in 2014, and 54 percent in 2015. The Project Partners and their contract water amounts are provided in **Table 3.11-5.**

Table 3.11-5: DPCR Project Partners Contract Water Amounts

Project Partner	Contract Water Amount (AFY)
Del Puerto Water District	140,210
Central California Irrigation District	840,000[1]
San Luis Canal Company	
Firebaugh Canal Water District	
Columbia Canal Company	

[1] Central Valley Project Water Contractors, March 30, 2016.

State Policies and Regulations

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act is California's statutory authority for the protection of water quality. Under this act, the State must adopt water quality policies, plans, and objectives that protect the State's waters. The act sets forth the obligations of the SWRCB and RWQCBs pertaining to the adoption of Basin Plans and establishment of water quality objectives. Unlike the federal CWA, which regulates only surface water, the Porter-Cologne Act regulates both surface water and groundwater.

The Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and the San Joaquin River Basin (CVRWQCB 2011) is designed to preserve and enhance water quality and protect the beneficial uses of all waters within the region. Specifically, the Basin Plan:

1. Designates beneficial uses for surface and groundwaters;
2. Sets narrative and numerical water quality objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's antidegradation policy;
3. Describes implementation programs to protect the beneficial uses of all waters in the Region; and
4. Describes surveillance and monitoring activities to evaluate the effectiveness of the Basin Plan [California Water Code Sections 13240 thru 13244, Section 13050(j)].

The Basin Plan is used as the regulatory authority for water quality standards established in local NPDES permits and other CVRWQCB decisions. The Basin Plan designates beneficial uses and water quality objectives for the San Joaquin River, the DMC and San Luis Reservoir.

Division of Safety of Dams (DSOD)

DSOD dam safety guidelines include criteria for the emergency evacuation of a reservoir and design of related facilities, such as the emergency spillway and outlet structure, required to evacuate flows. The proposed project is subject to DSOD design standards and criteria for operation. See *Section 3.8.2, Regulatory Framework*, in the *Geology Section* for additional description of design requirements of the DSOD.

California Water Code 6160 - 6162-Emergency Action Plans

Senate Bill (SB) 92, signed into law June 27, 2017, requires and emergency action plan (EAP) for all jurisdictional dams that do not have a low downstream hazard potential, as determined by the DWR Division of Safety of Dams. Jurisdictional dams are those more than 6 feet high or impounds more than 50 acre-feet of water. The project would be a jurisdictional dam and would require an emergency action plan as required by California Water Code Sections 6160 through 6162. The Division of Safety of Dams provides a thorough review of each dam proposal and provides specific requirements for design, monitoring and an emergency action plan for each dam proposal.

State Water Rights

California's system of water rights is referred to as a "dual system" in which both the riparian doctrine and the prior appropriation doctrine apply. Riparian rights result from the ownership of land bordering a surface water source (a stream, lake, or pond). These rights normally are senior in priority to most appropriative rights, and riparian landowners may use natural flows directly for beneficial purposes on riparian lands without a permit from the SWRCB.

Appropriative rights are acquired by diverting surface water and applying it to a beneficial use. Before 1914, appropriative rights could be obtained by simply diverting and using the water, posting a notice of appropriation at the point of diversion, or recording a copy of the notice of appropriation with the county recorder. Since 1914, the acquisition of an appropriative right also requires a permit from the SWRCB.

The SWRCB is responsible for overseeing the water rights and water quality functions of the state. The SWRCB has jurisdiction to issue permits and licenses for appropriation from surface water and subterranean streams flowing through known and definite channels. The California courts have jurisdiction over the use of percolating ground water, riparian use of surface waters, and the appropriative use of surface waters from diversions begun before 1914.

The Project Partners will file ~~have filed~~ a water right for any flows diverted from Del Puerto Creek to storage and/or subsequent use.

Streambed Alteration Agreement Program

Under Sections 1600–1616 of the California Fish and Game Code, any person, business, state or local government agency, or public utility that proposes an activity that would (1) substantially divert or obstruct the natural flow, (2) substantially change use of any material from the bed, channel, or bank of any river, stream, or lake, or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake, is required to notify the California Department of Fish and Wildlife (CDFW).

After such notification, the Streambed Alteration Agreement requires that the notifying entity and CDFW identify potential impacts of construction and mitigation measures required to minimize and avoid impacts. All portions of the project that would alter a waterway, including the reservoir expansion, would be subject to the Streambed Alteration Agreement Program. See *Chapter 3.4, Biological Resources* for further discussion of the CDFW Streambed Alteration Program.

Local Policies and Regulations

The discussion of existing policies and regulations focuses on Stanislaus County and the City of Patterson, the two jurisdictions where construction would occur.

Stanislaus County General Plan

The Stanislaus County General Plan guides development for the County with a 20-year planning horizon. The following goals/policies in the Stanislaus County General Plan, Conservation/Open Space Element would apply to the project:

GOAL TWO: Conserve water resources and protect water quality in the County.

Policy Five: Protect groundwater aquifers and recharge areas, particularly those critical for the replenishment of reservoirs and aquifers.

Policy Six: Preserve vegetation to protect waterways from bank erosion and siltation.

Policy Eight: The County shall support efforts to develop and implement water management strategies.

Policy Nine: The County will investigate additional sources of water for domestic use.

City of Patterson General Plan

Goal PS-1: To maintain an adequate level of service in the City's water system to meet the needs of existing and future development.

Policy PS-1.1 Water Supply. The City shall continue to use groundwater as a source of domestic water for the city. The City shall also pursue, as expeditiously as possible, a water supply program consisting of the development of multiple sources of water, the maximum use of recycled water, water conservation and groundwater management to accommodate projected water demand and provide for water supply security.

3.11.3 Impact Analysis

Methodology for Analysis

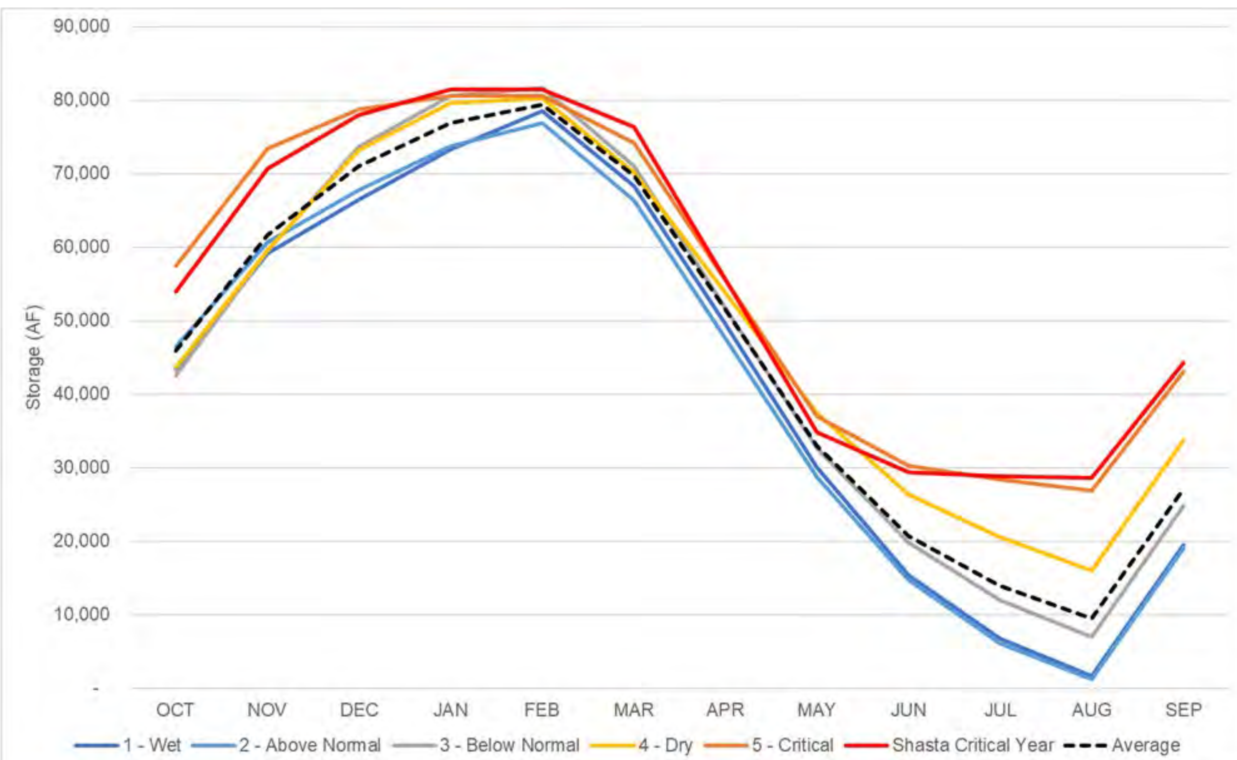
This section evaluates whether construction and operation of the proposed project would result in significant impacts related to hydrology and water quality. The analysis is based on a review of the hydrology and water quality studies referenced herein that have been developed for the proposed project.

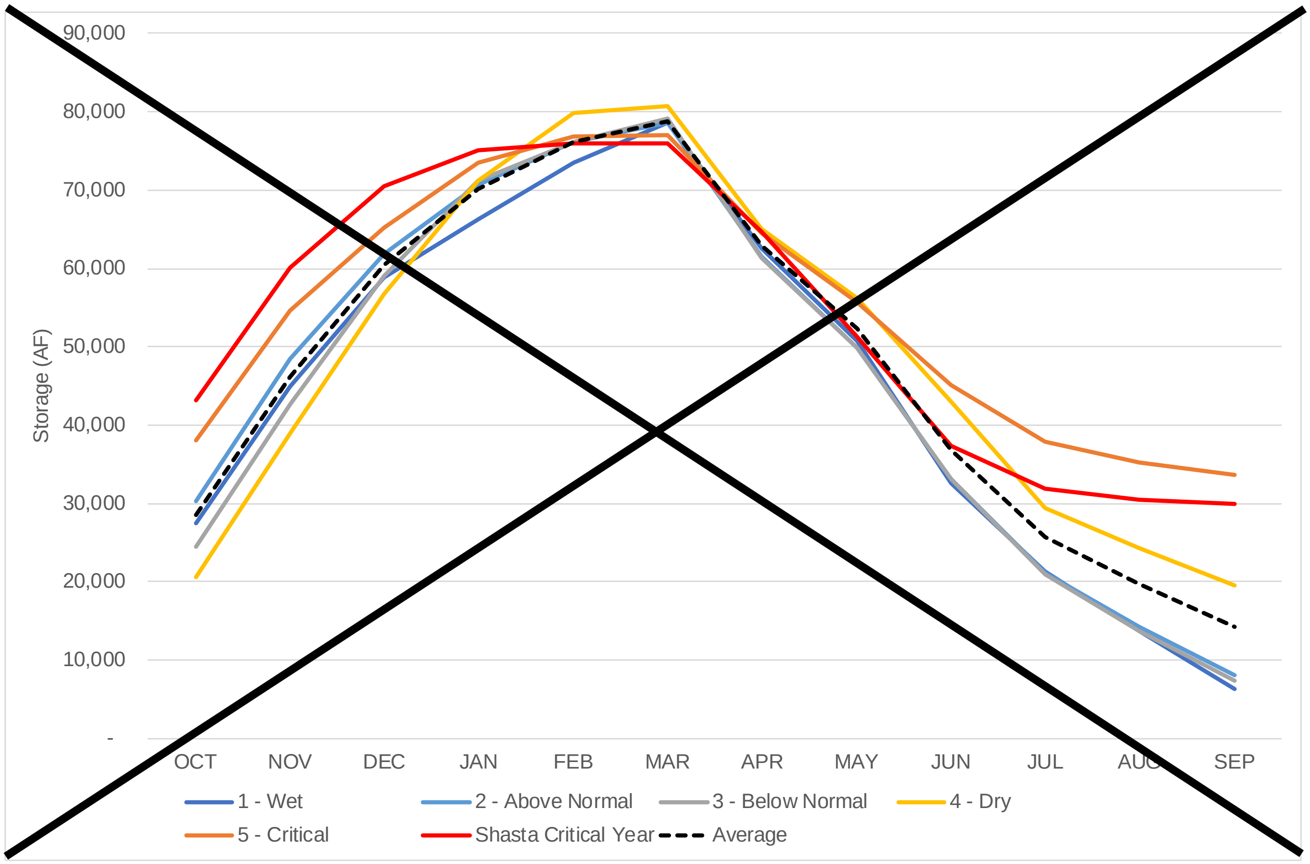
Reservoir Operations

Analysis of impact is based on the proposed operational regime for the reservoir. The proposed reservoir would total 82 thousand-acre feet (TAF), with 81 TAF available for storage with a 1 TAF dead pool. Source water for the reservoir would be from the DMC and Del Puerto Creek. On average approximately 95 percent of the reservoir would be CVP water supplied from the DMC and 5 percent would be from Del Puerto Creek.

The CVP water that would be stored in the Reservoir by the current Project Partners would be a portion of the annual allocation of deliveries to each of the Project Partners. In addition, in coordination with the Project Partners, Reclamation is proposing modification of its existing water rights to incorporate restorage of previously stored water in the Reservoir, i.e., water that has been previously stored in Shasta-Trinity and Folsom~~, and Friant~~ Dams and which has been released for delivery to CVP contractors or for storage in San Luis Reservoir. See *Chapter 2.3, Operation and Maintenance Requirements* for discussion of reservoir operations. Average expected reservoir volumes, as calculated using the DPCR Operations Model (**Appendix F**), are shown in **Figure 3.11-2**.

Figure 3.11-2: Expected Monthly Average Reservoir Volumes (revised)





Dam Breach Inundation Analysis

An inundation study was completed for the proposed project (NHC 2019), using a hydrologic rainfall runoff model for the watershed in which the reservoir is located. The hydrologic model parameters were calibrated using the flood events of March 1995 and February 1998, which represent the two largest peak discharges on Del Puerto Creek during the period for which data is available (1959 – present). The estimated maximum precipitation depths for a 72-hour storm were applied over the watershed and routed using the runoff model.

An estimate of the probable maximum flow was prepared consistent with the Department of Water Resources, Division of Safety of Dams guidance. The purpose of this analysis is to provide a basis for design of the dam spillway to eliminate any potential for overtopping of the dam as a result of a probable maximum precipitation event in the watershed upstream of the dam.

A dam breach scenario was run for the proposed reservoir to assess potential impacts. Preliminary dam failure scenarios were run for the main dam and for the I-5 Embankment. The scenario assumes the reservoir is at maximum normal pool elevation in compliance with DSOD standards. Breach parameters are specified in the California Code of Regulations (23 CCR § 335.6), using parameters established by the Federal Emergency Management Administration Guidelines for Inundation Mapping (FEMA 2013). Analysis assumes a breach width equal to the dam height, and a breach formation time of 3 hours from the first sign of a failure to a total breach of the dam.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines*, as updated in December 2018 an impact on hydrology and water quality would be considered significant if the project would:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin;
- 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 that would:
- Result in substantial erosion or siltation on- or off-site;
- Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
- 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;
- Impede or redirect flood flows;
- Place in flood hazard, tsunami, or seiche zones, risk release of pollutant due to Project inundation;
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan;

In addition to the Appendix G criteria, this section evaluates an additional potential effect:

- Conflict with the Coordinated Operation Agreement (COA) and CVP existing operations.

Criteria Requiring No Further Evaluation

The Initial Study (see Appendix A) determined that the project would not have significant impacts associated with the following criteria:

- Result in substantial erosion or siltation on- or off-site.
- Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.
- 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.
- Impede or redirect flood flows.
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Impacts and Mitigation Measures

Impact HYD-1 Violate any Water Quality Standards or Waste Discharge Requirements or Otherwise Substantially Degrade Surface or Ground Water Quality

Construction Impacts

Activities involving soil disturbance, excavation, cutting/filling, stockpiling, dewatering, and grading activities could result in increased erosion and sedimentation to surface waters during construction of the proposed project. If precautions are not taken to contain contaminants, construction could produce contaminated stormwater runoff, a major contributor to the degradation of water quality. In addition, hazardous materials associated with construction equipment could adversely affect surface and groundwater quality if spilled or stored improperly. In accordance with the Construction General Permit, a SWPPP would be developed for the proposed project detailing BMPs for all project construction activities including excavation, dewatering, and stockpiling.

During construction of the proposed project, dewatering would be conducted to remove excess groundwater from excavations created for building the dam, installing pipelines, and installing the pumping plant. Dewatering operations would be conducted in accordance with the General Order for Dewatering or other appropriate NPDES permits. The discharge from dewatering operations would be evaluated and made part of the project SWPPP.

Once the pipelines are constructed, hydrostatic testing would need to be conducted and water from the testing would need to be discharged. Water from testing would be discharged in accordance with the General Order for Dewatering or other appropriate NPDES permits.

The Construction General Permit and the General Order for Dewatering are well established regulatory processes that, when complied with, effectively limit threats to water quality from construction activities such as those that would be conducted as part of the proposed project. Compliance with the permits (implementation of Mitigation Measures HYD-1a and HYD-1b), would ensure potential impacts to the beneficial uses and water quality objectives of the downstream receiving waters, including Del Puerto Creek, DMC and the San Joaquin River are less than significant.

Operation Impacts

Compliance with DMC Discharge Water Quality Standards

Water stored within the proposed reservoir is expected to be 95 percent pumped water from the DMC and 5 percent from Del Puerto Creek flows. Because almost all of the water in the reservoir would come from the DMC, water quality within the reservoir is expected to meet DMC non-project discharge water quality standards. With implementation of Mitigation Measures HYD-1c, potential impacts to the beneficial uses and water quality of the DMC and CVP would be less than significant.

HABs

Nutrient concentrations in the DPCR would not be expected to be a limiting factor for HABs given that Delta water via the DMC and flows from Del Puerto Creek would both provide ample nutrients to support HAB formation within the proposed reservoir. Reservoir drawdowns during the May through October period is expected to result in increased water retention time and increased water temperature, and thereby create conditions favorable to HAB formation and potentially the maintenance of HABs. Further, reduced storage volumes during the summer months into early fall would potentially result in higher concentrations of cyanotoxins if HABs were to form because there would be less water in the reservoir for dilution relative to other times of year.

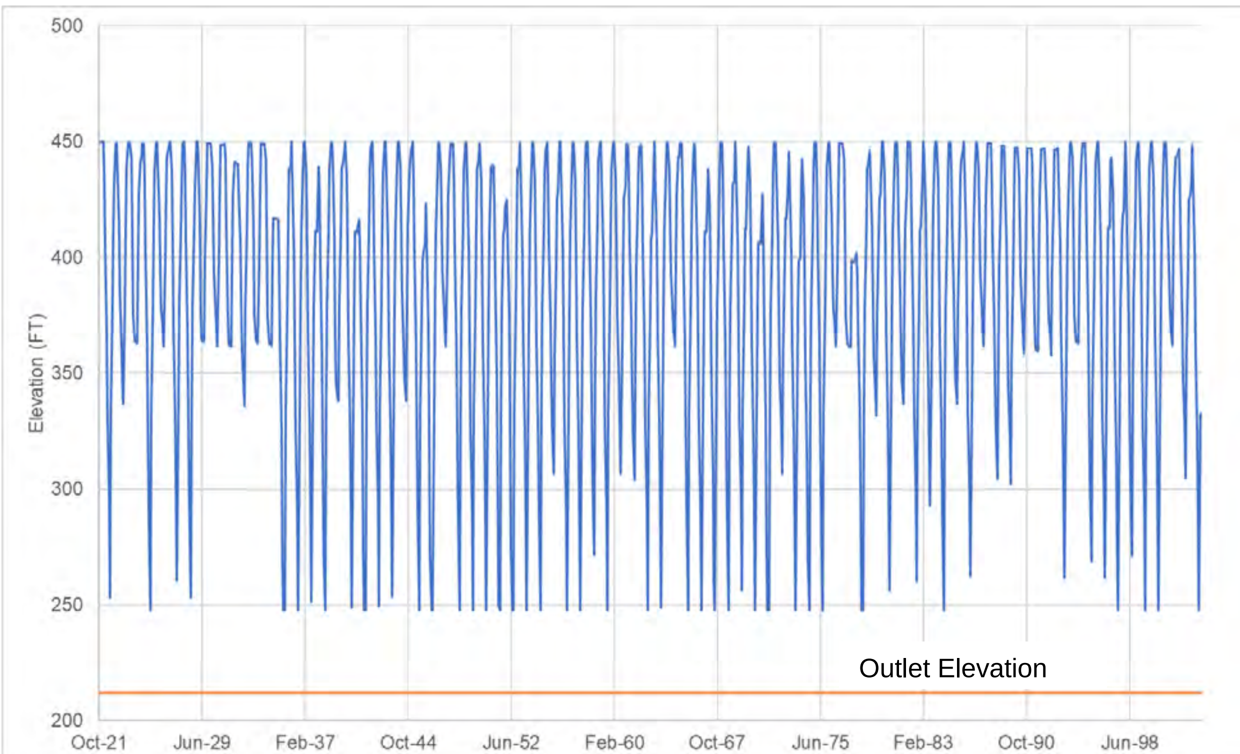
If HABs occurred in the reservoir they would degrade water quality directly, potentially through the release of cyanotoxins, as well as indirectly by potentially lowering dissolved oxygen when blooms die off. Modeling results indicate that the lowest surface water elevation in the reservoir for the 82-year modeling period is almost always approximately ~~6~~ 40 feet higher than the elevation of the inlet/outlet works, which would be at 212 feet above mean sea level **(Figure 3.11-3**); water levels occasionally drop within about 40 feet of the inlet/outlet. For the modeled period, water elevations are generally at the lowest annually in September. If HABs do occur in the reservoir it is very unlikely that cyanobacteria or cyanotoxins would be drawn through the outlet with water supplies because (1) the vertical distribution of the cyanobacteria would likely be limited to the water's surface or relatively close to the surface, as would cyanotoxins; and (2) the surface water elevation would be well above the inlet/outlet elevation during the May through October period. Therefore, cyanobacteria and cyanotoxins would not substantially degrade surface water quality. In addition, any HABs that may develop in the reservoir would be temporary (i.e., generally restricted to the May through October period) as they are expected to naturally die off at the end of the bloom season, and cyanotoxins, if present, are also expected to be seasonal and degrade. Finally, measures have been incorporated as part of the proposed project to ensure that cyanobacteria and cyanotoxins would not be exported from the reservoir (see *Project Description, Section 2.3.2, Reservoir*

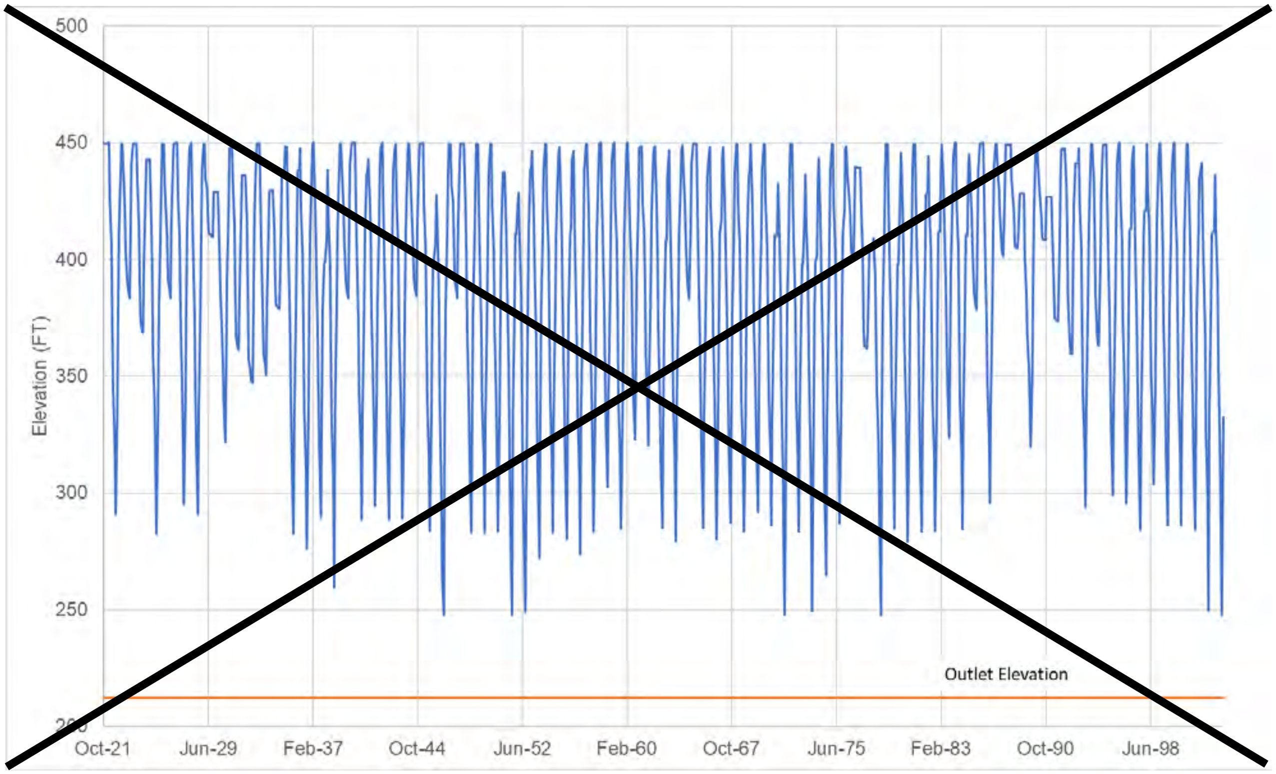
Management Plan). As such, water quality impacts from HAB would be less than significant, and no mitigation measures are required.

Significance before Mitigation

The potential for the proposed project to violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality is potentially significant for the proposed project before mitigation because of the inherent risk of construction-related activities and HABs causing water quality impacts.

Figure 3.11-3: Del Puerto Canyon Reservoir Average Monthly Storage Elevation (feet) (revised)





Mitigation Measures

Refer to **Mitigation Measure GEO-2** which requires preparation of a Storm Water Pollution Prevention Plan to protect water quality during construction.

Mitigation Measure HYD-1a: Comply with General Order for Dewatering or Other Appropriate NPDES Permit

To minimize the impacts to water quality from dewatering activities, the Project Partners shall implement measures contained in the General Order for Dewatering or other appropriate NPDES permit or Waste Discharge Requirement.

Mitigation Measure HYD-1b: Comply with Reclamation Monitoring Plan for Non-Project Water Pump-in

To minimize impacts to water quality for downstream users of the CVP, the Project Partners shall implement a monitoring plan based on the *Delta Mendota Canal Non-Project Water Pump-in Program Monitoring Plan* (USBR 2018) to ensure compliance with Reclamation water quality standards. The monitoring plan will include sampling and testing of water quality prior to water entering the DMC. Contingency plans shall be implemented if water quality does not meet Reclamation standards.

Significance after Mitigation

With implementation of **Mitigation Measure Geo-2** and **Mitigation Measures HYD-1a,** best management practices would be implemented during construction to prevent violation of water quality standards or degradation of surface or groundwater quality. **Mitigation Measure HYD-1b** would be implemented to ensure that discharges from the reservoir to the DMC would meet Reclamation water quality standards, thus impacts would be less than significant.

Impact HYD-2 Substantially Decrease Groundwater Supplies or Interfere Substantially with Groundwater Recharge Such That The Project May Impede Sustainable Groundwater Management of the Basin

Construction

Construction activities would not use groundwater and would not interfere with recharge so there would be no groundwater impacts associated with construction.

Operation

The Project Partners intend to submit an application to the State Water Resources Control Board to divert the flow of Del Puerto Creek to storage within the proposed project. According to the Woodard & Curran 2019 DPCR Operations Analysis (**Appendix F**), approximately 1,900 AFY of runoff in Del Puerto Creek currently percolates into the groundwater basin between approximately the DMC and the San Joaquin River and is therefore a source of supply to groundwater pumpers, including agricultural pumpers and the City of Patterson. An analysis of reservoir and groundwater operations shows capturing natural flow in the reservoir could decrease the volume of water that percolates from the creek into the groundwater basin from 1,900 AFY to 200 AFY (Woodard & Curran 2019; see **Appendix F**). Storage of water in the reservoir is estimated to contribute approximately 900 AFY to groundwater recharge.

In addition, the City of Patterson's Water Master Plan includes a proposed project to capture additional stormwater from Del Puerto Creek for groundwater recharge. This project, as described in the City's Water Master Plan, would produce a yield of up to 1,700 AFY from pumping recharged water under wet, above normal and below normal water year conditions. The yield would be up to 1,275 AFY in dry and critically dry water year conditions and would be assumed to be zero in a dry or critically dry year if the previous year was also dry or critically dry. Implementation of the proposed reservoir would reduce flows in Del Puerto Creek and thus result in a reduction of flows available for the City of Patterson storm water capture and recharge project.

Significance before Mitigation

Groundwater impacts are considered to be significant for the proposed project because groundwater recharge from flows in Del Puerto Creek would decrease from 1,900 AFY to 200 AFY.

Mitigation Measures

Mitigation Measure HYD-2: Develop Operation Requirements to Deliver Recharge Water to Lower Del Puerto Creek

The Project Partners shall develop an operations manual that describes water delivery to the lower reach of Del Puerto Creek below the proposed dam to make up for lost natural seepage due to the proposed project. The manual shall provide releases, for the City of Patterson's benefit depending on water year type and Del Puerto Creek inflows, of up to 1,700 AFY. Such releases will augment existing/no-project in-stream recharge conditions.

Significance after Mitigation

With implementation of **Mitigation Measure HYD-2**, the Project Partners would deliver water to ensure no reduction in groundwater supply available to the groundwater pumpers results from construction and operation of the proposed project, including reservation and release of flows to meet the City of Patterson's proposed future project. Impacts would thus be less than significant.

Impact HYD-3 In Flood Hazard, Tsunami, Or Seiche Zones, Risk Release of Pollutant Due to Project Inundation

Operation Impacts

100-Year Floodplain

With the construction and operation of the proposed reservoir, Del Puerto Creek flows would be captured in the reservoir and released in a controlled fashion within the channel of Del Puerto Creek. 100-year flow events that exceed the capacity of the creek downstream of the reservoir would no longer occur. It is expected that all Zone A, Zone AE, and Zone XO flood designations would be removed and the risk of flood from Del Puerto Creek flows between the proposed reservoir and San Joaquin River would be eliminated.

Dam Breach Analysis

A dam breach/inundation scenario was evaluated to determine the potential flood impacts in the event of failure of the main dam. A hypothetical breach of the main or any saddle dams has a very small to negligible probability of occurring since the dam structure will need to be designed to meet stringent safety requirements that will be required by the Division of Safety of Dams. However, if a breach of the main dam were to occur when the reservoir was completely full, outflow from the breach of the main dam would flow east, potentially overtopping I-5, the California Aqueduct, and the DMC, reaching east to the San Joaquin River, inundating agricultural lands and portions of the City of Patterson, primarily north of Las Palmas Avenue. The peak outflow from a breach of the main dam is estimated at ~~55~~ 800,000 cfs. The flood wave would flow east following Del Puerto Creek and would fan out in the relatively flat terrain east of I-5. The estimated flow velocity at Patterson would be 2-8 feet per second and the maximum depth would be approximately 6 feet. The flood wave would continue east to the San Joaquin River, where it would raise the level of the river by up to 14 feet. Depths reflect the maximum height of the flood wave and do not reflect the depth of a ponded inundation area.

If a saddle dam breach were to occur, outflow from the breach would flow south and then east, potentially overtopping I-5, the California Aqueduct, and the DMC, reaching east to the San Joaquin River, inundating agricultural lands and portions of the City of Patterson, primarily the northern half of the City. The peak outflow from a breach of the saddle dam when the reservoir was completely full is estimated at 500,000 cfs. The flood wave would travel down multiple small canyons to I-5, and then east across the relatively flat terrain east of I-5. The estimated flow velocity at Patterson would be 2-9 feet per second and the maximum depth would be approximately 10 feet. The flood wave would continue east to the San Joaquin River, where it would raise the level of the river by up to 12-13 feet.

As explained in *Section 2.4.4* of the *Project Description*, the Del Puerto Canyon dams would be designed and constructed pursuant to conservative guidelines and criteria designed to prevent failure. Design and construction would incorporate multiple levels of design redundancy as required to meet design standards of the Division of Safety of Dams (DSOD) and applicable current Federal dam safety guidelines for a new dam. The dams would be designed to withstand the largest and strongest expected earthquake (Maximum Credible Earthquake) and the greatest possible expected flood (Probably Maximum Flood). The design standards would protect the dams from seismic or other catastrophic failure.

Also, the operation of the dams would be monitored to control seepage and prevent uplift pressures or erosion of materials. A seismic monitoring array would be designed and implemented to monitor seismic activity and would be part of an active and ongoing dam safety monitoring program. An Emergency Action Plan would be developed and implemented for construction and operation in accordance with California Water Code Section 6160 *et seq.* and other applicable requirements. The plan would include emergency notification flowcharts, notification procedures, inundation maps and important emergency response protocols for notifying downstream entities if an emergency release is expected.

In accordance with DSOD guidelines, the proposed project would include an emergency spillway to release flows within an elevation set to the potential probably maximum flood water surface elevation. Because the DPCR is an "offstream" reservoir (i.e. it does not dam a major river) it would be filled by diversion from the DMC and would receive very little inflow from Del Puerto Creek, which is dry much of the year. During large rainfall events the reservoir would be operated so as to have enough capacity to handle inflows from Del Puerto Creek. The reservoir would have facilities allowing rapid emergency drawdown (or evacuation) of water in the event of an unsafe dam condition. The facilities would be designed to meet DSOD standards, which require the ability to lower the reservoir level by an amount equal to 10 percent of the hydraulic head behind the dam in 10 days and to evacuate the entire reservoir in 120 days. The DPCR would handle emergency drawdown via discharge from the outlet tunnel in the inlet/outlet structure, which would discharge into Del Puerto Creek. The design maximum discharge rate is about 1,000 cfs, which would allow the entire dam to be evacuated in approximately 40 days. However, the risk of an event requiring an emergency drawdown is limited because the upstream watershed flowing into the reservoir is small and potential inflows from Del Puerto Creek are trivial as compared to reservoir capacity; inflow into the reservoir is primarily controlled through pumping from the DMC.

Significance before Mitigation

The proposed project would be designed with multiple safety factors, which would result in an extremely low probability of dam breach. Because inflows and outflows to the reservoir would be managed through pumping the risk of an event requiring emergency release of water is also very low. The threat of project inundation is thus considered a less than significant impact.

Mitigation Measures

No mitigation is necessary.

Impact HYD-4: Conflict with Coordinated Operation Agreement and Existing CVP and SWP Operations

Del Puerto Water District's CVP contractual entitlement is 140,210 acre-feet. The Exchange Contractor's contractual entitlement is 840,000 acre-feet. The North Valley Regional Recycled Water Program Environmental Impact Report/Environmental Impact Statement (RMC 2015) analyzed the impact of the North Valley Project on DMC, SWP and CVP operations.

The operation of the proposed project would be to accept CVP deliveries at the turnout to the proposed reservoir, store the diverted water in the proposed reservoir, then release the water back to the DMC and deliver it to the respective Project Partners as need to meet irrigation and/or transfer requirements. Water diverted from the DMC to storage would be limited to water that has been previously stored in and released from CVP reservoirs, consistent with Reclamation's proposed modifications to its existing water rights permits.

Water stored in the proposed reservoir is water that would have been delivered directly to Del Puerto or the Exchange Contractors or would have otherwise been delivered to and stored in San Luis Reservoir. The proposed project would reduce the Project Partners' reliance on San Luis Reservoir for storage, thus increasing potential for San Luis to better meet other CVP needs.

As a result of this proposed operational scenario, operation of the DMC and California Aqueduct would not be impacted by the proposed project. No new infrastructure or modifications of existing facilities or operations at the C.W. Bill Jones Pumping Plant would be required. CVP and SWP facilities would not be impacted. There would be no increase in diversions from the Delta by Reclamation (or DWR) as a result of the proposed project and the proposed project would not interfere with Reclamation's obligations to deliver water to other contractors, wetland habitat areas, or for other environmental purposes. The proposed project operations would be ~~consistent with~~ subject to the Coordinated Operation Agreement and would not affect existing CVP Delta pumping operations. However, certain federal benefits may be achieved should Reclamation choose to pump additional water that could be stored in capacity made available in San Luis Reservoir by the Project Partners storing water in DPCR, or by shifting pumping to provide additional Delta pumping capacity during periods of peak delivery by pumping water for delivery to the Project Partners during non-peak delivery periods and delivering that water to the Project Partners for storage in DPCR. Any such modification of Delta pumping by Reclamation would be evaluated by Reclamation in a separate NEPA document if such pumping is determined to be outside existing certified environmental documentation and/or operating agreements.

The proposed project would have a negligible impact on San Joaquin River flows below the confluence of the San Joaquin River and Del Puerto Creek. Based on CalSIM modeling using the 1921 to 2003 historic hydrology, existing average annual San Joaquin River flows are 3,137,000 AF, while average annual Del Puerto Creek flow into the San Joaquin River is ~~2,700~~ 2,100 AF, contributing to approximately 0.0669% ~~61%~~ of the San Joaquin River flows. With the project, average annual Del Puerto Creek flows in the San Joaquin River would decrease to about ~~300~~ 400 AF. **Table 3.11-6** shows average annual flows from Del Puerto Creek to the San Joaquin River and **Table 3.11-7** shows monthly Del Puerto Creek flows as measured at the stream gage upstream of Interstate 5. Downstream of Interstate 5 the majority of flows percolate into the groundwater and do not reach the San Joaquin River. Del Puerto Creek flows discharging into the San Joaquin River only occur during wet weather events, when flows in the San Joaquin River are already high, so the small reduction during high flow periods would be imperceptible. During the dry season, creek flows are only present because of agricultural return flows, and these flows will not be changed by the proposed project. Reductions in creek flows into the San Joaquin River are thus not expected to impair water quality in the river. As shown in **Figures 3.5-4** through **3.5-8** in *Section 3.5, Biological Resources-Fish*, Del Puerto Creek accounts for a very small fraction of the total seasonal flows in the lower San Joaquin River. In water years 2015 – 2019, Del Puerto Creek flows reached the San Joaquin River only during high-flow events in December through April, when the San Joaquin River was also at peak flows for the season. Under proposed project operations, major flow events in Del Puerto Creek would continue to be released downstream in a pattern consistent with natural patterns of flow variability (as discussed in Section 2.3.1, *Reservoir Operations).*

Table 3.11-6: Del Puerto Creek and San Joaquin River Average Annual Flows (AFY)

	Current	Proposed Project
Del Puerto Creek Flow into San Joaquin River	2,100 ~~2,700~~	400 ~~300~~
San Joaquin River Flow[1]	3,137,000	3,135,300 ~~3,135,000~~
Percentage of Del Puerto Creek Flow in SJR	0.0669% ~~0.0861%~~	0.0128% ~~0.0096%~~

[1]CalSim Modeling Results for San Joaquin River at Vernalis

Table 3.11-7: Del Puerto Creek Monthly Average Flows without and with Project (AF)

Flow to SJR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Without Project	-	-	50	370	920	540	150	10	10	-	-	-
With Project	-	-	-	110	130	80	50	10	10	-	-	-
Reduction	-	-	50	260	790	460	100	-	-	-	-	-

Significance before Mitigation

The proposed project would store water from the DMC that has been previously stored in other CVP reservoirs such as Shasta-Trinity and Folsom~~, and Friant~~ Dams, and released from storage. The water stored in the reservoir is water for which the Project Partners have existing contracts with Reclamation, and the operations of the DMC (and the SWP) would not be affected by the proposed project. Thus, there would no impact to the COA.

Mitigation Measures

No mitigation is required.

Cumulative Impact Analysis

Cumulative Impacts to Hydrology

The geographic scope of the cumulative impacts on Hydrology encompasses the study area and surrounding areas. If the proposed project, as well as other projects listed in **Table 3.0-1**, would adversely affect the same surface or groundwater, they could result in significant cumulative impacts on hydrology in the area. The City of Patterson relies on groundwater. With the implementation of Mitigation Measure HYD-2, the impact from the proposed project on the City of Patterson's existing and future groundwater supply would be less than significant. Because Del Puerto Creek's influence on the San Joaquin River has been determined to be insignificant using CalSIM model data (**see Appendix F**), the effect of the proposed project on CVP operations is less than significant. It is not expected that the proposed project and other cumulative projects would combine to result in cumulative impacts to hydrology.

Cumulative Impacts to Water Quality

The geographic scope of the cumulative impacts on water quality related to HABs encompasses the study area and surrounding areas. If the proposed project, as well as other projects listed in **Table 3.0-1**, adversely affect water quality by creating conditions more favorable to HABs and causing an increase in HABs and therefore potentially cyanotoxins such that the beneficial uses of water in the project area are affected, there would be a significant cumulative impact. Operation of the Del Puerto Canyon Reservoir may create conditions in the reservoir conducive to HABs in the months of May through October, when blooms are most common in the Central Valley. However, it is expected that if HABs, and therefore cyanotoxins, occurred in the reservoir, they would be contained within the reservoir due to the physical construction of the reservoir (i.e., location of the inlet/outlet), the operation of the reservoir, and the implementation of the reservoir management plan. Thus, the incremental contribution of the proposed project would not be cumulatively considerable. The identified past, present and reasonably foreseeable future projects in the project area would not create conditions conducive to HABs either because they would not affect water quality by contributing to nutrient load or would not affect surface water hydrology by reducing flow and increasing residence times or water temperature.

Significance Determination

The proposed project would not result in a cumulatively considerable impact on water quality in the project area related to HABs because of the reservoir construction, operation, and implementation of the reservoir management plan. Therefore, cumulative impacts would not occur.

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3.12 Land Use and Recreation

This section presents the physical and regulatory setting for land use and recreation surrounding the proposed project. The impact analysis considers the potential for the project to physically divide the community or conflict with adopted land use plans or policies. The analysis is based on a review of local land use plans and policies and aerial imagery. California Government Code Section 53090 et seq. provides that public agencies receive intergovernmental immunity from the zoning and building laws of other cities and counties for construction of facilities for production, generation, storage, treatment or transmission of water. Thus, local regulations may not be applicable to the project. Although the Project Partners receive intergovernmental immunity from local planning and zoning ordinances, efforts will be made to maintain project consistency with these ordinances as much as possible. This section includes a discussion of the extent to which the proposed project is or is not consistent with the Stanislaus County General Plan; however, the General Plan does not govern those aspects of the proposed Project involving water storage and transmission. This section also provides an impact analysis of the project on recreational uses of Del Puerto Canyon in response to public comments received during the EIR scoping process.

3.12.1 Environmental Setting/Affected Environment

This section describes the environmental setting for current land use and recreation within the study area, which includes the proposed project site and adjacent land uses. Direct land use impacts would occur in Stanislaus County, where all project facilities are located.

Regional Setting

The project area is located at the western edge of California's San Joaquin Valley, approximately 15 miles southwest of the City of Modesto and 18 miles east of the City of Turlock. The majority of the project area lies to the west of Interstate 5 (I-5), with a portion of the project area extending east of I-5. The landscape consists of rolling hills with sparse structural development. Rangelands and agricultural lands dominate the land use pattern across the study area. More developed and urban land uses are situated to the east of the proposed study area in the city of Patterson.

The project would serve water to agricultural uses within the Project Partners' service areas in San Joaquin, Stanislaus, Merced, Fresno, and Madera counties. More information on agriculture within the region is presented in *Section 3.2, Agriculture and Forestry Resources*.

Project Vicinity

Direct impacts of project construction would be confined to Stanislaus County. The majority of the project area is located in unincorporated Stanislaus County. All of the project area that falls within unincorporated Stanislaus County, including the proposed roadway realignment, is zoned as a *General Agriculture District* (Stanislaus County 2016). The county zoning designations in the study area are shown in **Figure 3.12-1**. Further detail on county zoning is included in *Section 3.12.2, Regulatory Framework, Stanislaus County Zoning Code.*

A small portion of the proposed conveyance corridor lies within the Patterson city limits. This area is designated by the City of Patterson General Plan for light industrial uses (and is zoned West Patterson light industrial). **Figure 3.12-2** shows the city's General Plan designations. The general plan includes designations for land within the city limits, and land within the general plan area adjacent to the city. Further detail on City of Patterson zoning is included in *Section 3.12.2, Regulatory Framework, City of Patterson General Plan and Zoning Code.*

Figure 3.12-1: Stanislaus County Zoning Designations

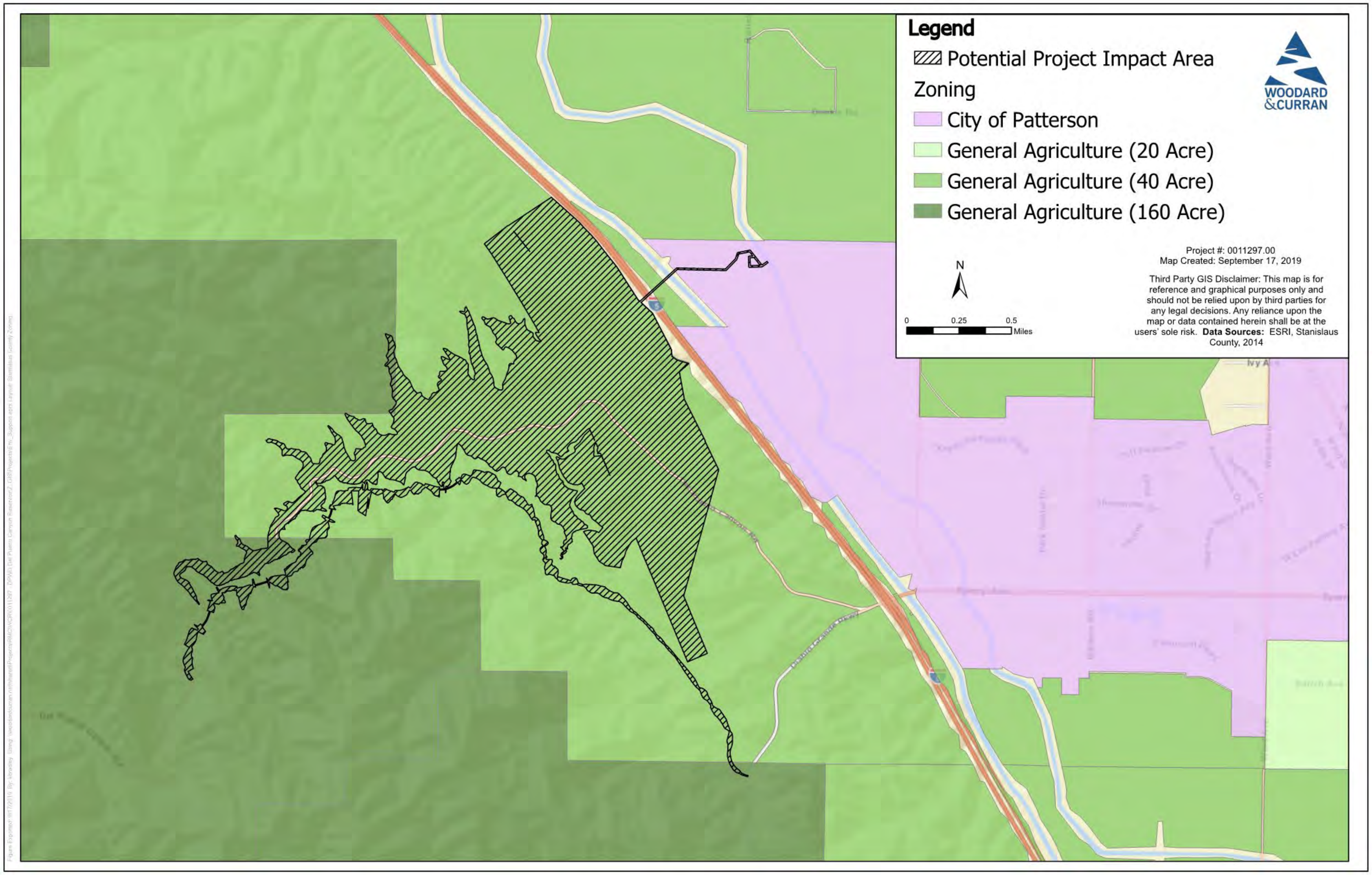
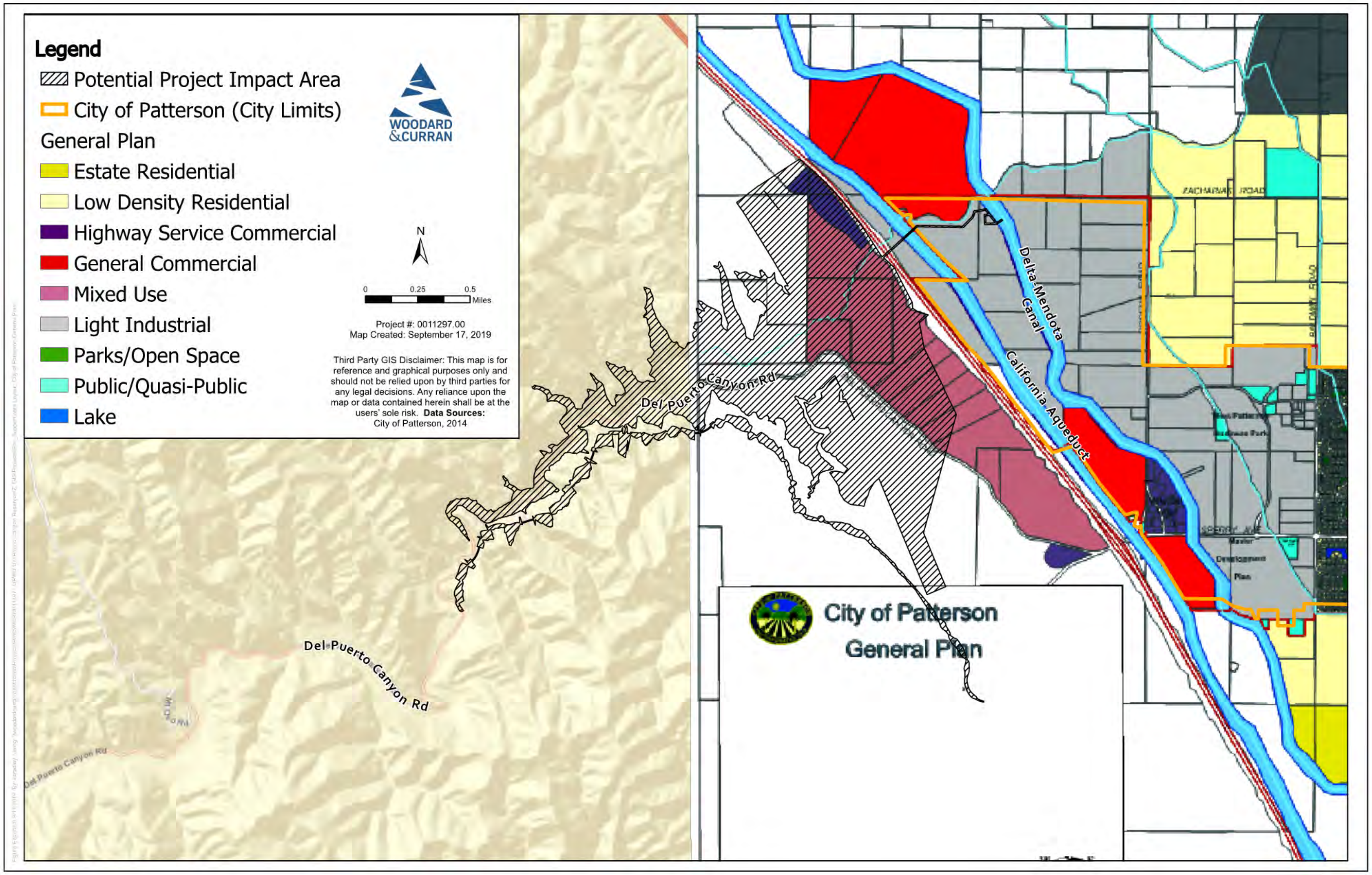


Figure 3.12-2: City of Patterson General Plan Map



The study area west of I-5 is undeveloped and composed of hilly rangelands currently used for grazing. East of I-5 lies the California Aqueduct, which runs parallel to the highway. The land between the I-5 and the California Aqueduct is flat and consists of agricultural land, however, no crops are currently grown there. The remainder of the study area lies between the California Aqueduct and the DMC. The terrain in this area is flat and is planted with abandoned orchards. Del Puerto Creek flows through the study area from west to east, passing under I-5 and the California Aqueduct and over the DMC.

Recreation

Recreational activities that are known to take place in Del Puerto Canyon include birdwatching, wildlife viewing, photography, bicycling, and motorcycling. The land on either side of the Del Puerto Canyon Road is private property, but members of the public still enjoy birdwatching and other activities from the public right of way. Del Puerto Canyon is a noted birding destination with well over 100 species of birds recorded from the canyon by birders (eBird 2019). Based on comments received during the scoping period for the EIR, it is apparent that Del Puerto Canyon also provides educational opportunities to at least one local science class that visits to learn about native plants, birds, and geology. Commenters also emphasized that Del Puerto Canyon is of local importance to botanists, entomologists, herpetologists, geologists and conservationists. Del Puerto Canyon provides access into the inner coast range and is notable for its rugged landforms and a generally perennial stream with its associated riparian vegetation.

Sensitive Receptors

Land uses such as residences, schools, day care centers, hospitals, and convalescent homes are considered to be more sensitive than the general public to certain environmental effects, and thus are collectively known as sensitive receptors. There are no schools, day care centers, hospitals, or convalescent homes within 1 mile of the study area. While the study area is not designated as residential in the Stanislaus County General Plan, there are three rural residential homes scattered in agricultural lands within 1 mile of the proposed project. However, none of these residences are within the project area itself. Therefore, the project area can be characterized as containing no sensitive land uses or sensitive receptors.

3.12.2 Regulatory Framework

This section describes laws and regulations that may apply to the proposed project. There are no federal or state policies or programs regulating land use that would apply to the proposed project.

Local Policies and Regulations

Most project facilities would be located within the jurisdiction of Stanislaus County. Portions of the conveyance facility alignment would be located within the City of Patterson city limits. Policies for Stanislaus County and the City of Patterson are presented below.

Stanislaus County General Plan

The Stanislaus County General Plan (Stanislaus County 2016) regulates land use and development in unincorporated areas of Stanislaus County and outlines goals and policies to guide zoning and land use decisions. The following policies in the land use element of the Stanislaus County General Plan are relevant to the proposed project:

GOAL ONE: Provide for diverse land use needs by designating patterns which are responsive to the physical characteristics of the land as well as to environmental, economic, and social concerns of the residents of Stanislaus County.

> **Policy Two:** Land designated Agriculture shall be restricted to uses that are compatible with agricultural practices, including natural resources management, open space, outdoor recreation and enjoyment of scenic beauty.

Policy Seven: Riparian habitat along the rivers and natural waterways of Stanislaus County shall, to the extent possible, be protected.

Implementation Measure One: All requests for development which require discretionary approval and include lands adjacent to or within riparian habitat shall include measures for protecting that habitat to the extent that such protection does not pose threats to proposed site uses, such as airports.

GOAL TWO: Ensure compatibility between land uses.

Policy Fourteen: Uses shall not be permitted to intrude into or be located adjacent to an agricultural area if they are detrimental to continued agricultural usage of the surrounding area.

GOAL THREE: Foster stable economic growth through appropriate land use policies.

Policy Seventeen: Agriculture, as the primary industry of the County, shall be promoted and protected.

Policy Eighteen: Promote diversification and growth of the local economy

Implementation Measure Seven: Strengthen the agricultural sector of the economy by continuing to implement the strategies for agriculture-related economic development identified under Goal One of the Agricultural Element.

Additionally, the following policies in the Conservation/Open Space Element of the Stanislaus County General Plan would apply to the proposed project:

GOAL FOUR: Provide for the open-space recreational needs of the residents of the County.

Policy Thirteen: Promote the use of water reservoirs for multiple recreational purposes, where appropriate.

Implementation Measure One: The County shall encourage the multiple uses of reservoirs as flood control devices, recreational facilities, and wildlife habitats.

Stanislaus County Zoning Code

The Stanislaus County Zoning Code is designed to promote and protect the public health, safety, peace, morals, comfort, convenience, and general welfare of those living and working within Stanislaus County. The zoning code provides a general plan of development for the county, and serves to guide, control and regulate the future growth of the county in accordance with the general plan. The project area is zoned as *General Agriculture District* (A-2); that is, the project area is designed to support and enhance agriculture as the predominant land use. Uses and policies regarding the General Agriculture District are intended to protect open space lands and ensure that all land uses are compatible with agriculture and open space, including natural resources management (Stanislaus County 2017).

The zoning code also includes specific guidance regarding Williamson Act contract lands. A discussion of the proposed project's consistency with existing zoning for agricultural use, or a Williamson Act contract, is included in *Section 3-2, Agricultural and Forestry Resources*.

City of Patterson General Plan and Zoning Code

The City of Patterson General Plan (2010) is a comprehensive, long-term plan which guides development and land use within the city and within certain areas adjacent to the city (the *general plan area*) (**Figure 3.12-2**). Within the general plan area, the city has designated "expansion areas" for additional development. The project area would include two of these expansion areas: the Canals Expansion Area (designated for commercial and light industrial development) and Foothills Expansion Area (designated for mixed-use hillside and highway service commercial development). The city's General Plan includes a brief, general overview of the issues to be addressed in the development of these areas in the future (e.g., visual and circulation impacts), but does not include detailed plans for these areas.

The following policies in the land use element of the City of Patterson General Plan are relevant to the proposed project:

GOAL LU-3: To designate adequate land and provide support for the development of commercial uses providing goods and services to Patterson residents and to become the commercial service hub for western Stanislaus County.

GOAL LU-5: To designate sufficient land to accommodate land uses serving the traveling public.

> **Policy LU-5.1:** Highway Commercial development. The City shall support the development of highway-serving commercial area near the Sperry Avenue/Interstate 5 interchange and near a future interchange in the vicinity of Zacharias Road.

GOAL LU-7: To designate adequate land and provide support for light and heavy industrial uses that create jobs and enhance the economy of Patterson.

The City of Patterson Zoning Code establishes zoning districts that determine allowable land uses within the city boundaries (City of Patterson 2017). The portion of the project area that is within the city is zoned as West Patterson light industrial (City of Patterson 2014). This designation is generally consistent with the city's light industrial designation (with minor exceptions that would not apply to the proposed project) (City of Patterson 2017). The city's general plan map also makes zoning determinations for areas that are within the general plan area. The portions of the project area that are outside the city limits but within the general plan area are zoned for mixed use, highway service commercial, general commercial, and light industrial uses. The zoning designations that are applicable within the project area are described below:

- **General commercial:** The general commercial land use type provides for land-extensive retail and wholesale commercial uses, offices, public and quasi-public uses, and similar and compatible uses. The purpose of the general commercial district is to stabilize, improve, and protect the characteristics of commercial businesses and to provide adequate locations for stores, shops, and offices which are supplying commodities or performing services for residents of the city as a whole. Public utility structures are not permitted in general commercial areas; electrical substations are allowed with a conditional use permit.
- **Light industrial (including West Patterson light industrial):** The light industrial designation provides locations for the development of industrial parks, warehouses, light manufacturing, public and quasi-public uses, and similar and compatible uses. Public utility structures are permitted in light industrial areas; electrical substations are allowed with a conditional use permit.
- **Mixed use:** The purpose of the mixed-use overlay district is to provide special flexibility within areas zoned for commercial or office development to allow for the addition of residential development. For a General Commercial area with mixed use overlay the permitted uses are defined by the General Commercial designation.
- **Highway service commercial:** The highway service commercial land use designation is applied to locations along highways and is intended to provide businesses and services to meet the needs of the traveling public. Under this zoning designation, public utility structures are not permitted; electrical substations are allowed with a conditional use permit.

3.12.3 Impact Analysis

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to land use or recreation. The analysis is based on a review of relevant local plans and aerial photography.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines*, as updated in December 2018, a land use and planning impact would be considered significant if the project would:

- 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.

Criteria Requiring No Further Evaluation

The Initial Study determined that the project would not have significant impacts associated with the following criteria for land use and recreation:

- Physically divide an established community.
- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial deterioration of the facility would occur or be accelerated.
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

Impacts and Mitigation Measures

Impact LU-1 Conflict with Any Applicable Land Use Plan, Policy, or Regulation

Consistency with Stanislaus County Policies

The proposed project would be consistent with the Land Use Element of the Stanislaus County General Plan. The general plan states that "agriculture, as the primary industry of the County, shall be promoted and protected." The project would improve the reliability of water supply for about 30,000 acres of agricultural land within the county, thereby protecting the agricultural industry. The general plan also states that "land designated for agriculture shall be restricted to uses that are compatible with agricultural practices, including natural resources management, open space, outdoor recreation and enjoyment of scenic beauty." The proposed project would help manage water supply, maintain open space, and allow for enjoyment of scenery from the realigned Del Puerto Canyon Road (similar to how the current road is used for recreation). The project would not consist of, nor encourage, industrial, commercial, or residential development; therefore, the project would not affect continued agricultural use of the surrounding area. The land use element also states that "riparian habitat along the rivers and natural waterways of Stanislaus County shall, to the extent possible, be protected." The implementation measure for this policy states that "all requests for development which require discretionary approval and include lands adjacent to or within riparian habitat shall include measures for protecting that habitat to the extent that such protection does not pose threats to proposed site uses, such as airports." The proposed project's impacts on riparian habitat are discussed in *Section 3.4, Biological Resources - Terrestrial* and would be reduced to less than significant with the implementation of **Mitigation Measure BIO-TERR-2**: Compensate for Effects on Riparian Habitat or Other Sensitive Natural Community, which would require creation or protection of riparian habitat. Therefore, the proposed project would be compatible with the Stanislaus County General Plan Land Use Element.

Land in the project area is zoned for General Agriculture, indicating that public buildings or other facilities operated by political subdivisions are a Tier Three use. Tier Three uses are consistent with the General Agriculture zone if (1) the use will not be substantially detrimental or in conflict with the agricultural use of other property in the vicinity and (2) the parcel on which the use is requested is not located in one of the County's most productive agricultural areas as defined in Stanislaus County's General Plan (Stanislaus County 2017). Per the Agriculture Element of the General Plan, the County does not prescribe a definition for the term *most productive agricultural areas;* rather, use of the term is determined on a case-by-case basis (Stanislaus County 2016). Factors to be considered include the following: soil types and potential for agricultural production; the availability of irrigation water;

ownership and parcelization patterns; uniqueness and flexibility of use; the existence of Williamson Act contracts; and existing uses and their contributions to the agricultural sector of the local economy (Stanislaus County 2016). The reservoir itself would convert agricultural land, and further detail on agricultural impacts of the project can be found in *Section 3.2, Agriculture and Forestry Resources*. However, the proposed project would provide a benefit of water supply reliability to surrounding agriculture, thereby supporting agriculture throughout the region, and the reservoir is located on grazing land, which is not the most productive type of agricultural in the county.

The project would convert some agricultural land within the project area, as discussed in *Section 3.2, Agriculture and Forestry Resources*. Construction of the project (primarily the conveyance facilities) could temporarily interfere with some adjacent agricultural uses, but once completed and operational, no disturbance to agriculture would be expected because existing agriculture in the project construction area is limited to abandoned orchards. Because the proposed project would improve water supply reliability for the agricultural community within Stanislaus County, it can reasonably be argued that the proposed project would be consistent with the general agriculture zone despite the conversion of agricultural land within portions of the project area. As such, the proposed project would not conflict with the Stanislaus County General Plan Agricultural Element.

The Conservation/Open Space Element of the Stanislaus County General Plan addresses recreation and reservoirs, stating that the county should "promote the use of water reservoirs for multiple recreational purposes, where appropriate." The Project Partners are open to Stanislaus County developing recreation areas in the future but are not proposing recreational facilities as part of the current project. The Project Partners do not have the resources or expertise to develop and manage recreation areas, so any recreational facilities would need to be developed and managed by the Stanislaus County Department of Parks and Recreation. The reservoir site could provide upland recreation such as camping, hiking and picnicking, but the reservoir is not expected to be suitable for water-based recreation. The reservoir slopes would be steep and the reservoir would be filled and drained frequently, resulting in extreme changes in water levels. Because of irrigation demands the water level would always drop substantially in the summer, making recreational water activities dangerous as new hazards would appear regularly. Due to these characteristics, the reservoir would not be appropriate for water-based recreation. Therefore, the proposed project would not conflict with the Conservation/Open Space Element of the General Plan (Policy Thirteen) which acknowledges that reservoir sites may not always be appropriate for multi-purpose recreational uses.

Consistency with City of Patterson Policies

Only a very small portion of the proposed project facilities would be constructed and operated inside the City of Patterson's city limits, the conveyance corridor is the only component that would be located within that being portions of the conveyance infrastructure may be constructed and operated in areas zoned for light industrial uses (West Patterson light industrial). The reservoir, utility relocation, and conveyance corridor (the portion outside the city limits) would pass through land that is part of the city's general plan area, including some areas where the city has made zoning designations. These areas are outside the city limits.

The City of Patterson General Plan goals that are relevant to the proposed project are intended to ensure that the City designates adequate land for commercial, industrial, and highway service activities. The City of Patterson Zoning Code includes restrictions on the types of facilities that may be allowed within each land use designation. Per City of Patterson Zoning Code, Section 18.96, all the proposed project facilities would be considered “public utility structures” or “electrical substations.”[1] The city’s definition of public utility structure indicates that “nothing in [the] definition is intended to require a land use permit” (City of Patterson 2017).

Public utility structures are permitted in light industrial areas (including West Patterson light industrial) but are not permitted in general commercial or highway service commercial areas, however electrical substations are allowed with a conditional use permit (City of Patterson 2017). Construction and operation of the proposed project facilities in light industrial and mixed-use areas would be consistent with the city’s general plan and zoning ordinance. Certain components of the proposed project (i.e., relocated utilities and conveyance infrastructure) may be constructed and operated within areas that the City of Patterson has zoned for general commercial or highway service commercial uses. Project components that would be constructed and operated in general commercial or highway service commercial areas are discussed in more detail below and summarized in **Table 3.12-1**.

Table 3.12-1: Summary of City of Patterson Zoning Designations and Potential Conflicts

Zoning Designation	Public Utility Structures Permitted?	Proposed Project Components within Zoning Designation	Potential for Conflict with Existing Zoning?
Light Industrial (including West Patterson Light Industrial)	Yes	Conveyance corridor (within city limits and general plan area)	No. Public utility structures are permitted in light industrial areas.
Highway Service Commercial	No	Utility relocation (within general plan area)	No. Construction and operation of the proposed project would not occur in any highway service commercial areas that are within city limits.
Mixed Use	Unspecified	Utility relocation (within general plan area) Reservoir (within general plan area)	No. No requirements specified for public utility structures. Construction and operation of the proposed project would not occur in any mixed use areas that are within city limits.

[1] The City of Patterson zoning code defines a public utility structure as a “a fixed-base structure or facility serving as a junction point for transferring utility services from one transmission voltage to another or to local distribution and service voltages. These uses include any of the following facilities: electrical substations and switching stations; telephone switching facilities; natural gas regulating and distribution facilities; public water system wells, treatment plants, and storage; and community wastewater treatment plants, settling ponds, and disposal fields. Nothing in this definition is intended to require a land use permit. These uses do not include uses that are not directly and immediately used for the production, generation, storage, or transmission of water, wastewater, or electrical power such as an office or customer service center.” The City also defines electric substation as “a moderate to large-scale facility serving a sub-area, entire city, or region, including power substations, water transmission lines, wireless base stations, sewer collectors and pump stations, switching stations, gas transmission lines, water storage tanks and reservoirs, and similar structures.” (City of Patterson 2017).

Utility Relocation

Some utility relocation (of the gas pipeline and electric transmission towers) may occur in the City of Patterson general plan area on land designated as highway service commercial. The relocated gas pipeline would be buried and would not interfere with future commercial activities in the area. Therefore, the pipeline relocation would not conflict with City of Patterson zoning regulations. The power lines would be raised or relocated to the front of the main dam. It is possible that one or more support structures (i.e., tubular steel monopoles or lattice steel structures) would be located within the highway service commercial land use type. In this case, **Mitigation Measure LU-1** would be implemented to avoid placing transmission structures in the highway service commercial area. With this mitigation measure the transmission support structures would not interfere with highway service commercial use, and the impact from utility relocation would be reduced to less than significant.

Conveyance Facilities

The proposed project's conveyance facilities may be constructed and operated in areas designated by the City of Patterson for highway service commercial or general commercial uses. The conveyance pipeline may pass through both land use designations. Because the pipeline would be buried, it would not prevent use of the area for commercial activities. There are no current commercial or industrial uses in the conveyance corridor, so no existing facilities would be disturbed. Therefore, the conveyance pipeline would not conflict with existing zoning.

The aboveground conveyance facilities would consist of a pumping plant and associated facilities which would be located at a single site adjacent to the DMC; potentially within the DMC right of way. The pumping plant site is within city limits and is zoned as West Patterson light industrial and thus the pumping plant would not conflict with existing zoning, and the proposed facilities would have no impact on land use plans or policies.

Therefore, the proposed project would have a less-than-significant impact in terms of conflict with City of Patterson zoning code and land use goal.

Significance before Mitigation

The proposed project would be consistent with most applicable Stanislaus County land use plans and policies related to land use. The proposed project could potentially have a significant impact on riparian habitat, which would conflict with Policy Seven of the Land Use Element of the Stanislaus County General Plan. The proposed project may conflict with City of Patterson zoning regulations if transmission towers are located in areas zoned as highway service commercial. The proposed pumping plant facilities are sited in areas zoned as industrial by the City of Patterson, and thus this impact would be considered less than significant.

Due to the potential for impacts to riparian habitat, and the possible location of transmission towers in areas zoned as highway service commercial, the proposed project would have a significant impact in terms of conflict with applicable land use plans, policies, or regulations.

Mitigation Measures

Mitigation Measure LU-1: Minimize Transmission Structures in Highway Service Commercial Areas

The relocated transmission towers shall be sited to avoid areas zoned for highway service commercial use.

Significance after Mitigation

With implementation of **Mitigation Measure LU-1**, the impact of the electrical transmission corridor relocation would be reduced to less than significant. The presence of transmission towers on highway service commercial land would be eliminated or reduced to the minimum extent that is technically feasible. This mitigation measure would limit the extent of the impact on highway service commercial areas and preserve the maximum amount of land possible for commercial use. With implementation of **Mitigation Measure** BIO-TERR-2: Compensate for Effects on Riparian Habitat or Other Sensitive Natural Community, impacts to riparian habitat would be reduced to a less-than-significant level. Therefore, with the implementation of **Mitigation Measure LU-1** and **Mitigation Measure BIO-TERR-2**, the proposed project's land use impacts would be less than significant.

Recreational Impacts

Certain wildlife-based recreation may be affected by the proposed project. Potential impacts to terrestrial wildlife, including birds, are addressed in *Section 3.4, Biological Resources – Terrestrial* section. The CEQA environmental checklist does not directly address recreational uses associated with the educational values of wildlife viewing. However, impacts to these recreational activities are evaluated here. With the realignment of Del Puerto Canyon Road, recreational uses, such as bicycling and motorcycling, would be preserved. The new roadway would be completed prior to closure of the existing road, therefore there would be no impacts on the general public's ability to enjoy these activities on the road and character of the road as a rural road would not change. Access to the existing Frank Raines Regional Park would be maintained and would not be adversely affected by the project. Because the proposed project would cause changes in habitat type and abundance in the reservoir inundation area, the project may have impacts on birdwatching, wildlife viewing, and other activities that rely on the existing local flora and fauna. Birdwatching, wildlife viewing, photography, and other activities could still occur from the public right-of-way along Del Puerto Canyon Road and access to the upper reaches of Del Puerto Canyon would be maintained. However, the specific species that may be observed may change following construction of the proposed project. Specific impacts to biological communities have been assessed in *Section 3.4, Biological Resources – Terrestrial*. Measures such as **Mitigation Measure BIO-TERR-1k**: Avoid and Minimize Impacts on Nesting Birds, and **Mitigation Measure BIO-TERR-5**: Develop a Management Plan for the Protection and Enhancement of Oak Woodlands, would ensure that effects on birds and wildlife in the project area would be minimized and that habitat values in the region would be preserved. Nevertheless, the experiences of birdwatching and wildlife viewing in the project area would be altered by the project.

The proposed project would not generate new population that could increase the use of existing recreational facilities resulting in substantial deterioration of a facility, nor would the proposed project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. Therefore, the proposed project would have no impact on recreation as determined by the CEQA guidelines. However, the proposed project would permanently alter the natural resources of lower Del Puerto Canyon, and thus impact informal recreational uses of this portion of the canyon, including birdwatching and wildlife viewing. While this is not considered as a significant impact under CEQA, it is an acknowledged effect of the project.

Cumulative Impact Analysis

The geographic scope of the cumulative impacts on land use and recreational resources encompasses the project area and surrounding areas. If the proposed project, as well as other projects listed in **Table 3.0-1**, would conflict with land use and planning policies or regulations, they could result in significant cumulative impacts. There are three relevant projects within the vicinity of the proposed project that may contribute to cumulative impacts:

- City of Patterson Water Master Plan: evaluated 13 water supply options, including a stormwater capture project to recharge 1,700 acre-feet of water from Del Puerto Creek.
- San Luis Transmission Project: new high voltage transmission line adjacent to existing transmission line corridor.

- Zacharias Master Plan: City of Patterson annexation of 1,295.6-acre area south of Zacharias Road and east of Rogers Road; Master Plan includes residential, mixed use, commercial, industrial, school, park and open space uses.

The City of Patterson Water Master Plan evaluates water supply options for the city. The water master plan is not related to land use and would not conflict with existing general plans or zoning. The San Luis Transmission Project would have no impact in terms of conflict with existing planning documents or zoning. The Zacharias Master Plan would alter land use in the project vicinity by annexing land to the City of Patterson for future development, including commercial development. The Zacharias Master Plan would support the City of Patterson's goal of designating adequate land for commercial development, therefore it is consistent with applicable land use policies and would not have a cumulative impact with the proposed project.

Significance Determination

Implementation of the proposed project, in conjunction with the projects listed above, would not create cumulative land use conflicts. None of the projects listed above are expected to create land use conflicts with the General Plan policies and zoning of Stanislaus County and the City of Patterson. The proposed project's land use impacts would be less than significant after mitigation. Thus, the proposed project, together with the projects listed above would not result in cumulative land use impacts.

3.12.4 References

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3.13 Traffic and Transportation

This section evaluates the potential adverse impacts related to transportation and traffic that could result from implementation of the proposed project. The analysis is based on a Transportation Impact Assessment that was prepared as a resource document for the Del Puerto Canyon Reservoir Project (Fehr & Peers 2019) (see Appendix G). The assessment includes information on existing conditions and addresses the proposed project's traffic impacts on the roadway system under construction, operation, and cumulative scenarios. The assessment also discusses the potential impacts to the adjacent bicycle, pedestrian, and transit network.

3.13.1 Environmental Setting

The following sections describe the environmental setting for transportation and traffic within the study area including the roadway network and transit, pedestrian, and bicycle facilities in the vicinity of the project site. **Figure 3.13-1** shows the roadways adjacent to the proposed project.

Roadway System

Interstate 5 (I-5) is a freeway serving the western US from its southern border with Mexico to its northern border with Canada. In the study area, I-5 provides two lanes in each direction, and a diamond interchange[1] with Sperry Avenue/Diablo Grande Parkway provides access to the City of Patterson to the east and the Diablo Grande community to the west. Average daily traffic within the project vicinity is 51,500 vehicles (Fehr & Peers 2019).

Del Puerto Canyon Road is a two-lane rural roadway, which originates 0.1 miles west of the I-5 interchange connecting Diablo Grande Parkway at about 8,400 feet west of I-5 in the east to Mines Road/San Antonio Valley Road in the west. The roadway has soft shoulders, and no bicycle lanes or sidewalk facilities are provided. The posted speed in the study area is 35 mph.

Diablo Grande Parkway is a two-lane rural roadway connecting I-5 in the east to the Diablo Grande community for approximately seven miles, which are marked as bicycle lanes in the vicinity of the Diablo Grande community (after the community entrance gate). No sidewalks are provided; however, the roadway has paved shoulders. The posted speed limit in the area is 40 mph.

[1] A diamond interchange is an interchange involving four ramps where they enter and leave the freeway at a small angle and meet the non-freeway at almost right angles. These ramps at the non-freeway can be controlled through stop signs, traffic signals, or turn ramps.

Figure 3.13-1: Project Area Roadways

Bicycle Facilities

Bicycle facilities are typically classified into four categories as described below:

- **Bicycle paths (Class I)** provide a completely separate right-of-way and are designated for the exclusive use bicycles and pedestrians with vehicle cross-flow minimized.
- **Bicycle lanes (Class II)** provide a restricted right-of-way and are designated for the use of bicycles for one-way travel with a striped lane on a street or highway. Bicycle lanes are generally a minimum of five feet wide. Vehicle parking and vehicle/pedestrian cross-flow are permitted.
- **Bicycle routes (Class III)** provide right-of-way designated by signs or pavement markings for shared use with motor vehicles. These include shared-lane markings to highlight the presence of bicyclists.
- **Class IV Bikeways (Class IV)** cycle tracks or “separated” bikeways provide a right-of-way designated exclusively for bicycle travel within a roadway and are protected from other vehicle traffic by physical barriers, including, but not limited to, grade separation, flexible posts, inflexible vertical barriers such as raised curbs, or parked cars.

Within the study area, Del Puerto Canyon Road has Class III “Share the Road” bicycle route signage to indicate the presence of bicyclists. Class II bicycle lanes are provided along Diablo Grande Parkway within and near the community of Diablo Grande.

Pedestrian Facilities

Pedestrian facilities include sidewalks, pathways, crosswalks, and pedestrian signals. The roadways in the study area are rural two-lane roadways, and no sidewalks or adjacent paths are provided. Crosswalks are not present at the three existing study intersections, which are side-street stop controlled.

Transit Services

There is no transit service provided in the project area. The nearest stop served by transit is just east of the I-5 and Sperry Avenue/Del Puerto Canyon Road interchange, on Rogers Road in Patterson. Stanislaus Regional Transit provides bus service to this stop via the 45W line, which connects Patterson to the communities of Gustine, Newman and Crows Landing to the south. This service operates Monday through Friday between 5:37 a.m. and 9:21 p.m., providing nine round trips, and on Saturdays between 6:20 a.m. and 7:56 p.m., providing five round trips.

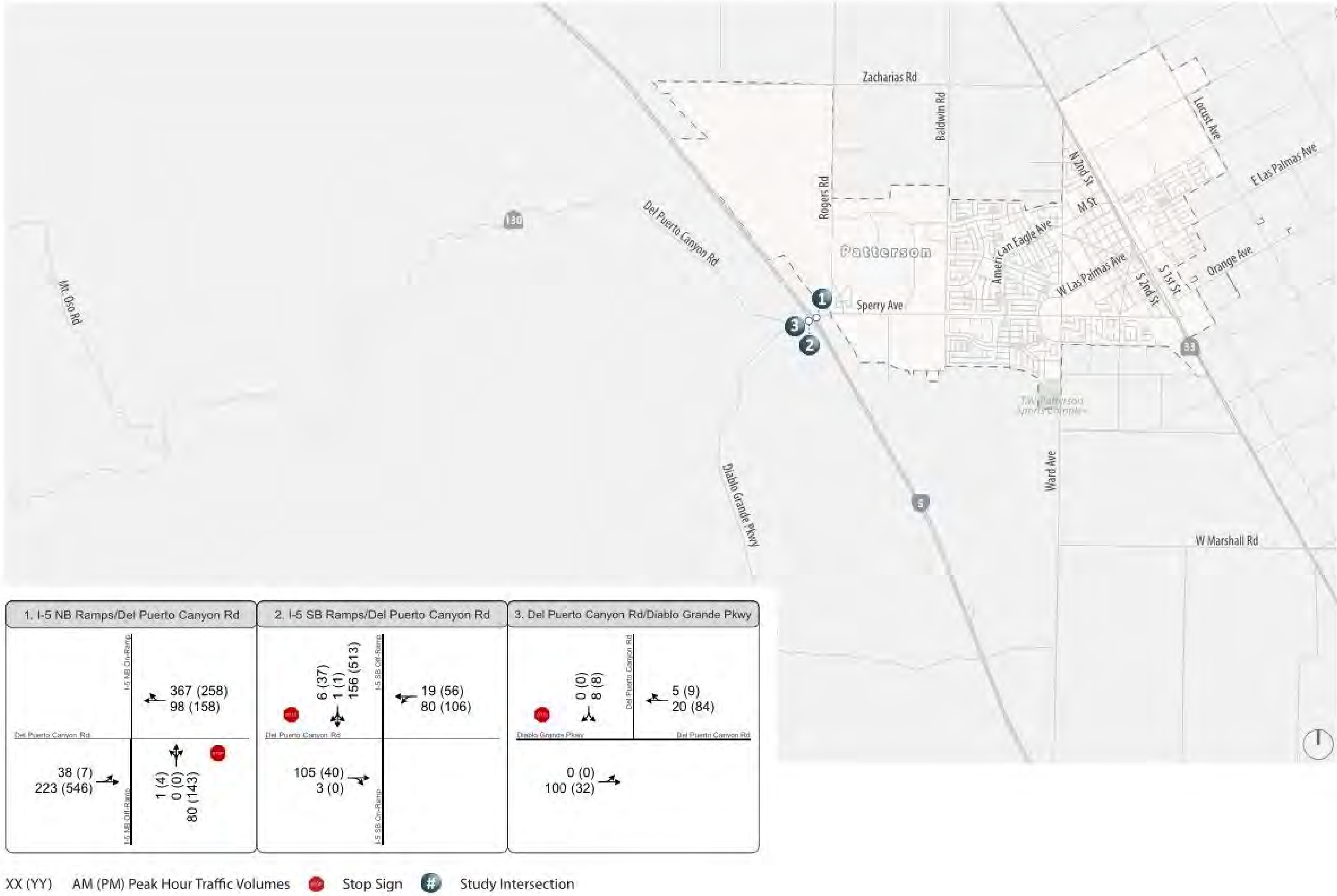
Traffic Counts

Weekday morning and afternoon peak period counts of vehicles, bicycles and pedestrians were conducted in May 2019 at the three existing study intersections. **Figure 3.13-2** presents the existing morning (AM) and evening (PM) peak hour traffic volumes at the three existing study intersections. No pedestrian or bicycle activity was observed during the counts.

In addition, 72-hour counts (Tuesday through Thursday) were collected in mid-May 2019 on Del Puerto Canyon Road north of Diablo Grande Parkway and Diablo Grande Parkway west of Del Puerto Canyon Road. The average daily volumes on these segments were as follows:

- Del Puerto Canyon Road north of Diablo Grande Parkway: 277 vehicles per day
- Diablo Grande Parkway west of Del Puerto Canyon Road: 1,623 vehicles per day

Figure 3.13-2: Existing Conditions at Study Intersections, Peak Hour



Collision Data

Available collision records for Del Puerto Canyon Road and Diablo Grande Parkway were compiled from the University of California, Berkeley's Transportation Injury Mapping System (TIMS). TIMS provides access to injury-related crash data through the California Statewide Integrated Traffic Records System. Collision records were taken from 2011 to 2015, as this represents the last five years of complete data available. Data for 2016 through 2018 is considered provisional and is subject to change.

There are five reported collisions within the project study area. Four of these collisions involved a motor vehicle colliding with a fixed object due to either travel at an unsafe speed, or improper turning movement. The fifth involved a cyclist that sustained an injury due to unsafe speed. In all cases, only one party was involved. The five collision severities include one complaint of pain, three visible injuries, and one severe injury. No fatalities were reported in the study area.

These types of collisions are not uncharacteristic given the study area's rural setting. Preventative best practices commonly employed in such settings include curve warning signage and edgeline rumble strips, which may warrant consideration during the design of the Del Puerto Canyon Road realignment.

Intersection Operations

Intersection operations are described using the term "Level of Service" (LOS), a quantitative measure of the average delay experienced by a driver at the intersection. LOS ranges from LOS A, with no congestion and little delay, to LOS F, with excessive congestion and delay. The Stanislaus County General Plan considers LOS C the lowest acceptable condition for both signalized and unsignalized intersections.

The intersections were evaluated using the 2010 Highway Capacity Manual operations methodology, which determines the capacity for each lane group approaching the intersection (Fehr & Peers 2019). LOS is based on the average stopped delay per vehicle (seconds per vehicle) for the various movements within the intersection. Table 3.13-1 presents the LOS and delay data for the study intersections under existing conditions. As shown in Table 3.13-1, currently the intersections operate within the applicable LOS standard for the intersections as a whole, but the I-5 southbound stop-controlled approach at Sperry Avenue/Diablo Grande Parkway operates at LOS E (40.9 seconds of delay) in the PM peak hour. The poor LOS results from the relatively high left turn volume, 513 vehicles, which must wait for gaps in the traffic flow along Del Puerto Canyon Road (Fehr & Peers 2019).

Table 3.13-1: Intersection Level of Service: Existing Weekday AM and PM Peak Hours

Intersection	Control Type	Existing Delay AM[1]	Existing LOS AM[1]	Existing Delay PM[1]	Existing LOS PM[1]
1. Sperry Avenue/Diablo Grande Parkway/ I-5 Northbound Ramps	Side-Street Stop	1.4 (10.2)	A (B)	2.0 (15.0)	A (C)
2. Sperry Avenue/Diablo Grande Parkway/ I-5 Southbound Ramps	Side-Street Stop	7.3 (12.7)	A (B)	31.0 **(40.9)**	D **(E)**
3. Del Puerto Canyon Road/Diablo Grande Pkwy	Side-Street Stop	0.6 (9.2)	A (A)	0.6 (9.2)	A (A)

Source: Fehr & Peers 2019.

Notes:

1. The whole intersection weighted average control delay is reported with the control delay for the worst movement reported in parenthesis.
2. Bold text indicates unacceptable LOS conditions (LOS E or F).

Signal Warrant Analysis

Unsignalized study intersections operating below acceptable standards during peak hours were studied to determine whether installation of a traffic control signal is justified. Unsignalized study intersections were evaluated under the Peak Hour Signal Warrant 3 criteria outlined in the 2014 California Manual on Uniform Traffic Control Devices. The intersection of Sperry Avenue/Diablo Grande Parkway I-5 Southbound Ramp operates at an overall LOS D in the PM peak hour, which is acceptable; however, because the southbound approach is stop-controlled, it operates at LOS E due to the high volume of left turns (513 vehicles). This high volume causes the intersection to meet the Peak Hour Signal Warrant in the PM peak hour under existing conditions. While the intersection of Sperry Avenue/Diablo Grande Parkway I-5 Northbound Ramp operates acceptably at an overall LOS A in the PM peak hour, the stop-controlled northbound approach operates at LOS C due to a high volume of right turns (143 vehicles). Combined with the high major street volume on Diablo Grande Parkway in the PM peak hour (969 vehicles total in both directions), the intersection meets the peak hour signal warrant in the PM peak hour.

3.13.2 Regulatory Framework

This section describes laws and regulations at the federal, state, and local level that may apply to the project.

Federal Highway Administration Manual on Uniform Traffic Control Devices

The Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices is a compilation of national standards for all traffic control devices, including road markings, highway signs, and traffic signals. This document, which has been administered by FHWA since 1971, is updated periodically to accommodate the nation's evolving transportation needs and addresses new safety technologies, traffic control tools and traffic management techniques. The most current version of the manual is dated 2009 and was published in the Federal Register on June 13, 2012 (FHWA 2012).

California Manual on Uniform Traffic Control Devices

Caltrans has modified the FHWA's Manual on Uniform Traffic Control Devices for use in California. Effective March 29, 2019, the latest version of the manual is Revision 4 (Caltrans 2019). The manual provides uniform standards and specifications for all official traffic control devices in California. These standards are the relevant adopted regulatory standards in the State of California for use on public roadways.

Caltrans Transportation Management Plan Guidelines

California Department of Transportation (Caltrans) Transportation Management Plan Guidelines (Caltrans 2009) outline strategies and guidelines that are needed to minimize traffic congestion during road work activities that are planned along existing Caltrans facilities. The guidelines established in this document identify processes, roles, and responsibilities for all planned construction, maintenance, and permit activities. Incorporation of these strategies in project construction documents and implementation of the strategies are expected to help reduce congestion and manage traffic impacts near work areas.

Stanislaus County General Plan

The Circulation Element of the Stanislaus County General Plan (Stanislaus County 2016) contains the following relevant policies and implementation measures:

GOAL ONE: Provide and maintain a transportation system throughout the County for the movement of people and goods that also meets land use and safety needs for all modes of transportation.

> **Policy Two:** The Circulation system shall be designed and maintained to promote safety by combining multiple modes of transportation into a single, cohesive system.

Implementation Measure One: The County shall maintain LOS D or better for all County roadways (Daily LOS) and LOS C or better at intersections (Peak Hour LOS), except, within the sphere of influence of a city that has adopted a lower level of service standard, the City standard shall apply. The County may allow either a higher or lower level of service standard for roadways and intersections within urban areas such as Community Plan areas, but in no case shall the adopted LOS fall below LOS D.

Implementation Measure Seven: Within the spheres of influence of any city, roadway improvements, dedications, building setbacks and road reservations shall meet the development standards of the city consistent with the Spheres of Influence Policy in the Land Use Element of the General Plan, except in those areas subject to an individual city/county agreement. These requirements may change from time-to-time through the adoption or revision of local land use plans or standards. To ensure consistency with a city's development standards, additional right-of-way may be required to meet the standards of that city. Where design and access requirements of a city differ from than those established by the County, development shall be required to meet the standards of the city. The County will consult with the city prior to the construction of transportation improvements within the sphere of influence to ensure consistency with the standards of that city.

Implementation Measure Ten: Traffic control devices (e.g., traffic signals, roundabouts), traffic calming, and other transportation system management techniques shall be utilized to control the flow of traffic, improve traffic safety, and minimize delays.

Policy Five: Transportation requirements shall be considered during planning, design and construction of commercial and industrial development to address safety, mobility, and accessibility needs.

Policy Seven: Bikeways and pedestrian facilities shall be designed to provide safe and reasonable access from residential areas to major bicycle and pedestrian traffic destinations such as schools, recreation and transportation facilities, centers of employment, and shopping areas.

Implementation Measure Five: To safely accommodate bicycle traffic, adequate pavement shoulder and/or striping shall be planned and implemented when constructing new roadways or implementing major rehabilitation projects in accordance with the County Standards and Specifications, the Caltrans Highway Design Manual, or other nationally recognized standard.

Policy Eight: Promote public transit as a viable transportation choice.

GOAL TWO: Maintain a balanced and efficient transportation system that facilitates inter-city and interregional travel and goods movement.

Policy Nine: The County shall promote the development of safe inter-city and interregional transportation facilities that more efficiently moves goods and freight within and through the region.

3.13.3 Impact Analysis

Methodology for Analysis

The following assumptions and methodology were used to evaluate the proposed project's potential transportation related impacts:

Scenario Development

The Transportation Impact Assessment evaluated four scenarios: existing conditions, conditions during project construction, conditions during project operation, and cumulative conditions. The existing conditions were assumed to represent conditions at the commencement of environmental review, and are discussed above in *Section 3.13.1, Environmental Setting*. The traffic impacts associated with the construction of the realigned roadway and dam were analyzed in the construction scenario (which corresponds to the Near-Term scenario discussed in the Transportation Impact Assessment), the operation scenario (which corresponds to the Existing With Project scenario in the Transportation Impact Assessment), and the cumulative scenario is used to analyze cumulative traffic impacts over a long-term horizon. The cumulative scenario is based on expected traffic conditions in 2040 based on residential and employment growth forecasts (StanCOG 2018) as documented in Appendix G.

Roadway Realignment

The roadway realignment (which corresponds to Roadway Alignment Alternative 1 shown in **Figure 3.13-1**) would be constructed over a period of about 2 ½ years. The realigned roadway would be approximately 24,500 feet long and connect to Diablo Grande Parkway at a location about 8,400 feet west of the current Sperry Avenue/Diablo Grande Parkway intersection. The total distance for trips currently using Del Puerto Canyon Road between the Diablo Grande Parkway intersection and points to the east of the study area would increase by 0.44 miles.

Based on the construction vehicle estimates and schedule description for the roadway realignment (which are provided in the Technical Appendix to the Traffic Impact Assessment, Appendix G to this EIR), the following traffic would be generated during roadway construction:

- Construction workers: 20 round trips to the worksite per day (650 days total)[2]
- Dump trucks: 8 trucks in use per day-100 days total (number of truck round trips to site per day is not known at this time)
- Concrete trucks: 10 trucks in use per day-30 days total (number of truck round trips to site per day is not known at this time)

Based on the available information, a peak-traffic day might include the following commute peak hour traffic:

- AM peak hour: 20 inbound worker trips, 8 inbound dump truck trips, and 10 inbound concrete truck trips (38 trip total)
- PM peak hour: 20 outbound worker trips, 8 outbound dump truck trips, and 10 outbound concrete truck trips (38 trips total)

The actual peak hour traffic on any given day may be higher or lower, depending on the schedule for the hauling and concrete work.

For purposes of the intersection LOS evaluation, all construction trucks and worker vehicles were assumed to access the realignment project via the I-5/Sperry Avenue/Diablo Grande Parkway interchange, proceeding on Diablo Grande Parkway toward the west.

Del Puerto Canyon Dam and Supporting Infrastructure

For the purposes of the traffic impact analysis, the traffic during dam construction is the key project element. Once operational, the dam is not anticipated to generate substantial traffic. Traffic generated by maintenance personnel, while not estimated here, would be minimal during weekday peak hours.

Construction Plan

The dam and associated infrastructure, other than utilities, would be constructed over a period of about four years.

Based on construction vehicle estimates and schedule description (which are provided in the Technical Appendix to the Traffic Impact Assessment, Appendix G to this EIR), the following traffic would be generated on a daily basis at various times during the construction of the various project elements:

[2] This assumes no carpooling. Carpooling would reduce the vehicle round trips.

- Dam construction: 23 worker round trips, up to 74 truck round trips
- Pipeline construction: 20 worker round trips, up to 75 truck round trips
- Pumping plant construction: 20 worker round trips, up to 51 truck round trips
- Petroleum pipeline relocation: 20 worker round trips, up to 53 truck round trips
- Transmission line relocation: 20 worker round trips, up to 2 truck round trips

It is very unlikely that all of these construction elements would simultaneously generate peak traffic for extended periods, as petroleum pipeline and transmission line relocation would take place before construction of other facilities. Both workforce levels and truck deliveries/off-hauling/cement pours are expected to fluctuate depending on the detailed schedules of each construction component, which have not yet been developed. Nevertheless, there may be periods during the overall four-year construction schedule when over 300 daily round trips could be generated. This would be additive to the daily trips generated by the roadway realignment construction.

All construction trucks and worker vehicles are assumed to access the project via the I-5/Sperry Avenue/Diablo Grande Parkway interchange, to Del Puerto Canyon Road.

Construction Peak Hour Trip Generation

The construction plans and schedules described above have not been developed to a level of detail that would allow estimates of total daily and peak hour traffic volumes per phase during the roughly five years of construction activity (February 2022 to March 2027). However, based on the available information, Fehr & Peers developed a possible scenario for the AM and PM peak commute hour volumes at the study intersections, as follows:

- 10 percent of the construction workforce would arrive and depart in the AM and PM peak hours, respectively
- 10 percent of the daily truck round trips would arrive and depart in the AM and PM peak hours, respectively

For the heavy vehicle trips, a Passenger Car Equivalent (PCE) factor is applied within the intersection analysis software to account for the large number of heavy vehicle trips. For intersection operations, the PCE factor was assumed to be two, which effectively doubles the number of vehicles assumed in the intersection analysis (for heavy vehicles only). Based on the available data, it was determined that about 70 percent of peak hour construction traffic would be made up of heavy vehicle trips.

Trip Distribution and Assignment

Peak hour construction trips were distributed based on available truck route information and the project’s proximity to the cities of nearby cities such as Patterson, Modesto, and Turlock. The following distributions were assumed for construction vehicle and worker traffic:

- Heavy vehicle traffic
    - 40 percent of trips to/from the north on I-5
    - 40 percent of trips to/from the south on I-5
    - 20 percent of trips to/from the Patterson, Turlock, Modesto area, east of the I-5 Sperry Avenue/Diablo Grande Parkway Interchange
- Worker traffic
    - 33 percent of trips to/from the north on I-5
    - 33 percent of trips to/from the south on I-5

- o 33 percent of trips to/from the Patterson, Turlock, Modesto area, east of the I-5 Sperry Avenue/Diablo Grande Parkway Interchange

Trips were then assigned through the roadway network to the project site. All trips were assigned through the study intersections at the I-5 Sperry Avenue/Diablo Grande Parkway Interchange. For the purpose of intersection analysis, it was assumed all trips associated with the roadway realignment would enter and exit the project site from Diablo Grande Parkway. All dam construction trips are assumed to enter and exit the project site from Del Puerto Canyon Road via Diablo Grande Parkway.

Post-Construction Conditions

Upon completion of the roadway realignment and dam construction, trips currently using Del Puerto Canyon Road between Diablo Grande Parkway and points east would use the chosen roadway realignment alternative. This would re-route westbound right turns and southbound left turns at the intersection of Diablo Grande Parkway/Del Puerto Canyon Road to the new intersection of the chosen roadway realignment alternative with Diablo Grande Parkway. (Note that the May 2019 traffic counts recorded no eastbound left turns nor southbound right turns at the existing intersection of Del Puerto Canyon Road/Diablo Grande Parkway.)

The remaining stub of Del Puerto Canyon Road north of Diablo Grande Parkway would no longer be a public road when the project is complete and the reservoir is operational; therefore, this intersection is not analyzed in the operation or cumulative scenarios.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines*, as updated in December 2018, an impact on traffic and transportation would be considered significant if the project would:

- Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities;
- Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b);
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); and
- Result in inadequate emergency access.

To address conflicts with a program plan, ordinance or policy, the following are relevant significance criteria and regulations used by Stanislaus County and Caltrans for determination of impacts associated with the proposed project. The project would conflict with County and/or Caltrans policies under the following conditions:

- Project traffic at a Stanislaus County intersection (intersections 3, 4 and 5 as shown on **Figure 3.13-1**) would result in intersection operations below the Stanislaus County acceptable thresholds:
  - o For an intersection in Stanislaus County, the project would cause the LOS to degrade to LOS D or worse; or
  - o For an intersection that already operates at LOS D, the project adds traffic to the intersection.
- Project traffic at a Caltrans owned and operated intersection (intersections 1 and 2 as shown on **Figure 3.13-1**) would result in intersection operations below the Caltrans acceptable thresholds:
  - o If a Caltrans facility is projected to operate at LOS D or better without project and the project is expected to cause the facility to operate at LOS E or worse, the impact may be considered significant.
  - o If a Caltrans facility is projected to operate at LOS E or F without project and the project is expected to increase delay, the impact may be considered significant.

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway facilities; however, Caltrans recognizes that achieving LOS C/LOS D may not always be feasible.

For the purposes of this analysis of consistency with CEQA Guidelines Section 15064.3, subdivision (b)(1), the proposed project is considered to be a transportation project because it involves the realignment of a roadway. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. However, neither DWPD nor Stanislaus County have established standards or thresholds for VMT generation and impact evaluation.

Impacts and Mitigation Measures

Impact TR-1 Conflict with a Plan, Ordinance or Policy Addressing the Circulation System, Including Transit, Roadway, Bicycle and Pedestrian Facilities

Construction Impacts

The construction of the dam, supporting infrastructure, and roadway realignment would take approximately six years and would generate varying levels of worker and truck traffic throughout the construction schedule. An estimate of potential typical AM and PM peak hour trips was developed in the Transportation Impact Assessment. Construction traffic would not change intersection levels of service but would increase delays. **Table 3.13-2** presents the intersection delays in the near term with construction traffic. The intersection of Sperry Avenue/Diablo Grand Parkway/I-5 Southbound Ramps would continue to operate at an unacceptable LOS in the PM peak hour, with or without construction traffic. The addition of construction traffic results in a temporary significant impact to intersection operations by contributing further delay to the deficient intersection during project construction.

Table 3.13-2: Near-Term Intersection Delays during Construction

Intersection	Control Type	Near-Term No Project Delay AM[1]	Near-Term No Project Delay PM[1]	During Construction Delay AM[1]	During Construction Delay PM[1]
1. Sperry Avenue/Diablo Grande Parkway/I-5 Northbound Ramps	Side-Street Stop	1.5 (11.2)	2.7 (19.1)	2.1 (13.4)	3.4 (22.5)
2. Sperry Avenue/Diablo Grande Parkway/I-5 Southbound Ramps	Side-Street Stop	8.6 (17.4)	**90.4 (130.8)**	9.3 (20.1)	**131.2 (202.8)**
3. Del Puerto Canyon Road/Diablo Grande Road	Side-Street Stop	0.9 (9.7)	0.9 (9.6)	1.9 (10.4)	2.3 (10.3)

Source: Fehr & Peers 2019.
Notes:
1. The whole intersection weighted average control delay is reported with the control delay for the worst movement reported in parenthesis.
2. Bold text indicates delays that represent unacceptable LOS conditions (LOS E or F).

During construction the project would add delay to the Sperry Avenue/Diablo Grande Parkway/I-5 Northbound Ramps intersection, but these impacts are not significant based on the significance criteria presented above.

Stanislaus County, the City of Patterson and Caltrans are in the process of preparing a Project Approval/Environmental Document for the I-5/Sperry Avenue Interchange Improvements project, which would widen Sperry Avenue under I-5 to four lanes, widen the off-ramps to provide multiple turn lanes, and signalize both ramp intersections. The funding plan for this project would come 70 percent from the City of Patterson and 30 percent from Stanislaus County, with both agencies pursuing state and federal funds. Because the Project Approval/Environmental Document is not final, Stanislaus County Council of Governments has not yet allocated funding for the project in the Regional Transportation Plan.

There are currently no dedicated bicycle facilities or pedestrian facilities in the study area, and negligible pedestrian and bicycle activity was observed during weekday traffic, pedestrian and bicycle counts. However, Del Puerto Canyon Road is a popular recreational cycling route, so it is assumed that weekend bicycle traffic would be higher than during the weekdays. Project construction would introduce substantial truck and other heavy vehicles traffic to the study area, which would negatively impact the comfort and convenience of any pedestrians or bicyclists using Del Puerto Canyon Road and Diablo Grande Parkway within the construction area.

Operation Impacts

The effect of the completed project on traffic volumes would be to re-route turning movements at the intersection of Diablo Grande Parkway/Del Puerto Canyon Road to the intersection of the realigned roadway. **Table 3.13-3** presents the intersection levels of service under operation conditions. With the rerouted traffic volumes to the realigned roadway, the resulting intersection levels of service at the two remaining existing intersections (the I-5 ramp intersections) would remain unchanged. The levels of service at the potential new intersection formed by the realigned roadway with Diablo Grande Parkway would be similar to the levels of service at the existing intersection of Diablo Grande Parkway/Del Puerto Canyon Road.

All intersection service levels would be within the applicable LOS standard, with the exception of the southbound approach at the intersection of Sperry Avenue/Diablo Grande Parkway/I-5 Southbound Ramps in the PM peak hour. As shown in **Table 3.13-1**, the intersection of Sperry Avenue/Diablo Grande Parkway/I-5 Southbound Ramps currently operates at LOS E for the off-ramp approach, which is below the Caltrans standard, and this intersection would remain at LOS E during project operation. Project operation would not add measurable traffic to this intersection, and therefore the project would have a less-than-significant impact at the intersection.

Table 3.13-3: Intersection Levels of Service during Operation

Intersection	Control Type	Delay AM[1]	LOS AM[1]	Delay PM[1]	LOS PM[1]
1. Sperry Avenue/Diablo Grande Parkway/I-5 Northbound Ramps	Side-Street Stop	1.4 (10.2)	A (B)	2.0 (15.0)	A (C)
2.Sperry Avenue/Diablo Grande Parkway/I-5 Southbound Ramps	Side-Street Stop	7.3 (12.7)	A (B)	31.0 **(40.9)**	D **(E)**
4. Diablo Grande Parkway/Roadway Realignment	Side-Street Stop	0.6 (9.2)	A (A)	0.6 (9.2)	A (A)

Source: Fehr & Peers 2019.

Notes:

1. The whole intersection weighted average control delay is reported with the control delay for the worst movement reported in parenthesis.
2. Bold text indicates unacceptable LOS conditions (LOS E or F).

There are currently no pedestrian or bicycle facilities, nor transit service, on the portion of Del Puerto Canyon Road that would be abandoned and realigned, and no plans currently exist to add such facilities or service. Because the realigned roadway is expected to be designed to conform with applicable design standards (see discussion under Impact TR-3), the roadway would provide adequate vehicle lane widths and shoulder widths, signing and striping, to serve motorized vehicles and bicyclists. It is assumed at this time that dedicated bicycle lanes would not be provided, since none currently exist on Del Puerto Canyon Road. Based on this evaluation, this impact is less than significant.

Significance before Mitigation

As shown in **Table 3.13-1**, the intersection of Sperry Avenue/Diablo Grande Parkway/I-5 Southbound Ramp is projected to operate at an overall LOS F under Near-Term conditions in the PM peak hour. The construction of the proposed project is forecast to add about 34 seconds of delay to the intersection average delay, and about 60 seconds of delay to the southbound ramp delay. This is a significant impact based on Caltrans thresholds. **Mitigation Measure TR-1** would be implemented to reduce the impact of the proposed project on the intersection of Sperry Avenue/Diablo Grande Parkway/I-5 Southbound Ramp during construction. The LOS at the Sperry Avenue/Diablo Grande Parkway/I-5 Northbound Ramp is projected to be acceptable with or without the project during both construction and operation. Therefore, the proposed project's impact at this intersection would be less than significant with the Implementation of Mitigation Measure TR-1.

Mitigation Measures

Mitigation Measure TR-1: I-5 Sperry Avenue ~~Road~~ Interchange Improvements Project Contributions

The Project Partners shall work with Stanislaus County and the City of Patterson to contribute a fair share toward the planned I-5 Sperry Avenue ~~Road~~ Interchange Improvements project. The signal at the I-5 Southbound Ramps intersection is required to mitigate the project impact. The signal at the I-5 Northbound Ramps intersection is recommended to provide efficient operations at both intersections, which are closely spaced and which would not function acceptably with signal control at one intersection and side-street stop-control at the other. The proportional share calculation should take into account the existing deficiency at the Southbound Ramps intersection and the non-project traffic volume growth between the existing conditions and near-term conditions without the project, as well as the County and City's plans to secure other state and federal funding for the Interchange Improvements project.

Alternatively, the Project Partners may pay a traffic mitigation fee per peak hour trip or another negotiated contribution. Because the planned Interchange Improvements Project is not expected to be fully funded and complete until after the proposed project's construction period, Stanislaus County and the City of Patterson may choose to use the funding contribution, along with other funding sources if available, to erect temporary traffic signals during dam and roadway realignment construction.

In addition to contributing funding for a traffic signal at the I-5/ Sperry Avenue ~~Road~~ Interchange, the project partners shall explore development of alternative access to the dam site. It may be possible to direct a portion of the construction traffic along Zacharias Road. Although the public road ends at the DMC, there are bridges across the DMC and California Aqueduct and an undercrossing of Interstate 5, which could provide access to the dam site.

Significance after Mitigation

With the I-5/ Sperry Avenue ~~Road~~ Interchange Improvements, the intersection levels of service during construction would improve to acceptable levels.

Because the provision of the improvements depends on the actions of other agencies and feasibility of the alternative access from Zacharias Road is uncertain, this impact would remain significant and unavoidable after mitigation.

Impact TR-2 Conflict or Be Inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b)

Construction Impacts

Construction of the proposed project would result in additional VMT in the study area due to construction traffic. This increase in VMT would be typical of a construction project and would be temporary. Therefore, construction of the proposed project would have no impact on the long-term VMT in the region.

Operation Impacts

The total distance for trips currently using Del Puerto Canyon Road to the east of the study area would increase by 0.44 miles with the realigned roadway. Because the roadway realignment results in longer travel distances for such trips, the daily VMT in the study area would increase. As shown in Table 3.13-4, the increase would be 149 VMT per day, which constitutes a six percent increase over the existing VMT per day.

Table 3.13-4: Vehicle-Miles Traveled (VMT): Project Operation

Case	VMT per Day	VMT Change	% Increase
Existing Alignment	2,467	--	--
Realignment	2,616	149	6%

Source: Fehr & Peers 2019.

The proposed project would not cause VMT increase due to factors other than the increased road distance. The project would not induce vehicle traffic within the study area or the region. The project would not induce new trips, nor would it result in changes to transportation mode choice or routes. The project would not cause land uses changes that would result in an increase to VMT (e.g., constructing housing away from a center of employment). The area where the increased VMT would occur is neither congested nor projected to become congested.

Significance before Mitigation

Although the project would result in a slight increase in VMT (6 percent, or 0.44 miles of increase for trips currently using Del Puerto Canyon Road between the Diablo Grande Parkway intersection and points to the east of the study area), this increase would apply only to existing trips that occur along Del Puerto Canyon Road. Because project impacts on VMT would be limited to a slight increase in trip lengths for existing traffic the project's impacts on VMT would be less than significant.

Mitigation Measures

None required.

Impact TR-3 Substantially Increase Hazards Due to a Geometric Design Feature (e.g., Sharp Curves or Dangerous Intersections) or Incompatible Uses (e.g., Farm Equipment)

Construction Impacts

Project construction would introduce a substantial number of large trucks and other heavy vehicles to the study area over the course of the approximately six-year construction schedule. These heavy vehicles may move slowly as they maneuver through the study intersections and cause potential conflicts with regular users of the roadway network, including residents and employees in Patterson and residents in the Diablo Grande community. Therefore, the proposed project could substantially increase hazards due to design features or incompatible uses.

Operation Impacts

It is presumed that the proposed project, including the Del Puerto Canyon Dam and supporting infrastructure (including the dam facilities access roadway) and the realigned Del Puerto Canyon Road, would be designed in conformance with all applicable codes and standards. The realigned roadway and dam facilities access roadway can therefore be assumed to comply with roadway standard plans and specifications maintained by Stanislaus County, the Caltrans Highway Design Manual (where applicable), and the California Manual on Uniform Traffic Control Devices. Once complete, the dam and realigned roadway are not expected to serve a different traffic mix (more heavy vehicles, for example) than currently uses the study area roadways. Therefore, this impact is less than significant.

<u>Significance before Mitigation</u>

Due to the substantial number of heavy vehicles needed to construct the reservoir over the six-year construction schedule, construction of the proposed project has the potential to conflict with regular users of the roadway network in the project area. This impact is significant.

<u>Mitigation Measures</u>

Mitigation Measure TR-2: Implementation of Construction Traffic Management Plan

The Project Partners shall prepare a detailed Construction Traffic Management Plan to address traffic conditions throughout the construction period. As part of the plan development, the Project Partners and their construction contractors shall meet with appropriate Stanislaus County, City of Patterson, and Caltrans departments to determine traffic management strategies to reduce, to the maximum extent feasible, traffic congestion and safety effects during construction of the proposed project. The Project Partners shall develop the plans for review and approval by the appropriate City, County and Caltrans departments. The plans shall include at least the following items and requirements:

A. A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak traffic hours, detour signs if required, lane closure procedures, signs, cones for drivers, and designated construction access routes.

B. Location of construction staging areas for materials, equipment, and vehicles at approved locations.

C. A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an on-site complaint manager. The manager shall determine the cause of the complaints and shall take prompt action to correct the problem.

D. Provision for accommodation of pedestrians and bicyclists in the construction area.

E. Provision for parking management and spaces on the project site for all construction workers to ensure that construction workers do not park on-street where insufficient shoulder space exists.

F. A plan for restoration of pavement to pre-construction conditions after completion of all construction.

G. Other items deemed necessary by the City, County and Caltrans during preparation of the Construction Traffic Management Plan.

<u>Significance after Mitigation</u>

The construction traffic management plan would implement procedures to mitigate the potential for construction traffic to conflict with existing roadway users (e.g., through signage, establishment of construction routes, and appropriate staging areas). With the implementation of **Mitigation Measure TR-2**, the construction traffic impact would be reduced to a less-than-significant level.

Impact TR-4 Result in Inadequate Emergency Access

Construction Impacts

As described under Impact TR-1, project construction would introduce a substantial number of large trucks and other heavy vehicles to the study area, over the course of the approximately six-year construction schedule, creating periods of delay to area traffic, which may affect emergency response times. The construction traffic management plan described in Mitigation Measure TR-2 would address this impact and ensure that the impact on emergency responders is minimized.

Operation Impacts

The project would increase the travel distance for drivers on Del Puerto Canyon Road between points east of the dam and west of the dam by 0.44 miles due to the roadway realignment. While emergency responders destined for points on Del Puerto Canyon Road within the study area would potentially need to travel longer distances to reach their destination, the realigned roadway alternatives would not impede responders, as they would be designed to conform with applicable design standards (see discussion under Impact TR-3). The realigned roadway alternatives would not affect emergency response travel routes or times to the community of Diablo Grande nor Patterson, as emergency responders would virtually all come to/from the east (City of Patterson). Therefore, this impact is less than significant.

Significance before Mitigation

Without mitigation, the impact of construction traffic over the six-year construction schedule could create traffic delays which may affect emergency response times. Delay in emergency response times would constitute a significant impact.

Mitigation Measures

See **Mitigation Measure TR-2**.

Significance after Mitigation

With implementation of **Mitigation Measure TR-2**, construction impact on emergency responders would be minimized. Procedures implemented in the construction traffic management plan would include measures to minimize traffic congestion and safety effects caused by construction traffic, including impacts to emergency responders. Therefore, implementation of **Mitigation Measure TR-2** would reduce the construction traffic impact to a less-than-significant level.

Cumulative Impact Analysis

The cumulative impacts of the project were analyzed using traffic forecasts for the year 2040. It is estimated that the City of Patterson would have 4,183 new households and 5,252 new jobs, while the Diablo Grande Community would have 194 new households (Fehr & Peers 2019).

The peak hour trip generation associated with this growth in households and jobs was estimated in the Transportation Impact Assessment. The trip distribution for the new Diablo Grande community trips was assumed to be 100 percent to/from the I-5 interchange, The trip distribution for new Patterson trips was assumed to be about 19 percent of residential trips travel to/from I-5 and 10 percent of employment trips travel to/from I-5 (based on an existing regional model). These trips were then assigned to the study intersections based on the existing proportional turning movements at the intersections. In addition to the above growth forecasts, the traffic on Del Puerto Canyon Road north of Diablo Grande Parkway was increased by one percent per year to reflect potential nominal growth on this very low-volume roadway.

Table 3.13-5 presents the Cumulative (2040) LOS with and without the project, and **Table 3.13-6** presents the Cumulative (2040) delays with and without the project. The significant traffic growth forecast for the City of Patterson, along with Diablo Grande community growth, results in LOS F conditions for the stop-controlled approaches at both I-5 ramp intersections. This projected LOS is unaffected by the proposed project, which does not change the traffic projection at these two intersections. The LOS at the intersections of the Roadway Realignment/Diablo Grande Parkway is projected to be within the applicable standard.

Table 3.13-5: Cumulative (2040) with Project Levels of Service

Intersection	Control Type	No Project LOS AM[1]	No Project LOS PM[1]	With Project LOS AM[1]	With Project LOS PM[1]
1. Sperry Avenue/Diablo Grande Parkway/I-5 Northbound Ramps	Side-Street Stop	A (C)	C **(F)**	A (C)	C **(F)**
2. Sperry Avenue/Diablo Grande Parkway/I-5 Southbound Ramps	Side-Street Stop	**F (F)**	**F (F)**	**F (F)**	**F (F)**
3. Diablo Grande Parkway/Del Puerto Canyon Road	Side-Street Stop	A (B)	A (B)	--	--
4. Diablo Grande Parkway/Roadway Realignment Alternative 1	Side-Street Stop	--	--	A (B)	A (B)

Source: Fehr & Peers 2019.
Notes:
1. The whole intersection weighted average control delay is reported with the control delay for the worst movement reported in parenthesis.
2. Bold text indicates unacceptable LOS conditions (LOS E or F).

Table 3.13-6: Cumulative (2040) with Project Delays

Intersection	Control Type	No Project Delay AM[1]	No Project Delay PM[1]	With Project Delay AM[1]	With Project Delay PM[1]
1. Sperry Avenue/Diablo Grande Parkway/I-5 Northbound Ramps	Side-Street Stop	2.4 (19.8)	18.3 **(129.7)**	2.4 (19.8)	18.3 **(129.7)**
2. Sperry Avenue/Diablo Grande Parkway/I-5 Southbound Ramps	Side-Street Stop	**124 (>200)**	**528 (>200)**	**124 (>200)**	**528 (>200)**
3. Diablo Grande Parkway/Del Puerto Canyon Road	Side-Street Stop	1.4 (11.7)	1.3 (11.7)	--	--
4. Diablo Grande Parkway/Roadway Realignment Alternative 1	Side-Street Stop	--	--	1.4 (11.6)	1.4 (11.5)

Source: Fehr & Peers 2019.
Notes:
1. The whole intersection weighted average control delay is reported with the control delay for the worst movement reported in parenthesis.
2. Bold text indicates unacceptable LOS conditions (LOS E or F).

Under cumulative conditions, with or without the project, the two Sperry Avenue/Diablo Grande Parkway/I-5 Ramp intersections, have sufficient traffic volumes to warrant installation of a traffic signal as they do under existing conditions. The projected growth in traffic generated by the City of Patterson and the Diablo Grande community by the year 2040 would worsen conditions and make provision of traffic signals more important to reduce congestion and manage peak hour traffic flows.

As shown in **Table 3.13-7**, VMT under cumulative conditions would not differ from VMT during project operations in the near-term. VMT per day with the realigned roadway is still expected to 6 percent (149 VMT) greater than it would be with the current alignment. This would not constitute a significant cumulative impact.

Table 3.13-7: Vehicle-Miles Traveled (VMT): Cumulative Conditions

Case	VMT per Day	VMT Change	% Increase
Existing Alignment	2,467	--	--
Realignment	2,616	149	6%

Source: Fehr & Peers 2019.

Significance Determination

As shown in **Table 3.13-5**, the intersections of Sperry Avenue/Diablo Grande Parkway/I-5 Northbound Ramps and Sperry Avenue/Diablo Grande Parkway/I-5 Southbound Ramps are projected to operate at LOS F for the off-ramp approaches, and Sperry Avenue/Diablo Grande Parkway/I-5 Southbound Ramps is projected to operate at an overall LOS F in the PM peak hour. These results are below the Caltrans standard. However, the project is not forecast to add traffic to this intersection under cumulative conditions. Therefore, the impact is less than significant.

Mitigation Measures

None required.

3.13.4 References

California Department of Transportation (Caltrans). 2009. Transportation Management Plan Guidelines.

Fehr & Peers. 2019. Del Puerto Canyon Reservoir Transportation Impact Assessment. September 2019. Included as Appendix G of this EIR.

Federal Highway Administration's (FHWA). 2012. Manual on Uniform Traffic Control Devices.

Stanislaus County. 2016. General Plan. Available online at http://www.stancounty.com/planning/pl/general-plan.shtm. Accessed on July 22, 2019.

Stanislaus Council of Governments (StanCOG). 2018. 2018 Stanislaus County Regional Transportation Plan/Sustainable Communities Strategy.

3.14 Tribal Cultural Resources

This section evaluates the potential impacts on tribal cultural resources associated with implementation of the proposed project. For the purpose of this analysis, the study area includes tribal cultural resources in the vicinity of the facilities to be constructed or modified under the proposed project, as described in Chapter 2, *Description of the Proposed Project*. Any remains of prehistoric people that may be located in the study area and have archeological value are addressed in accordance with CEQA guidelines section 15064.5 in *Section 3.6, Cultural Resources*. Section 3.6 also addresses and evaluates impacts on historic archeological and built-environment cultural resources.

3.14.1 Environmental Setting

The discussion below defines the terms used in the tribal cultural resources evaluation and describes the tribal cultural resource conditions of the region and study area.

Definitions

Tribal cultural resources are defined in the *California Environmental Quality Act* (CEQA) as:

(1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe that are either of the following:

   (A) Included in or determined to be eligible for inclusion in the California Register of Historical Resources (CRHR).

   (B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

(2) 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 (PRC) Section 5024.1.

Assembly Bill (AB) 52 defines a California Native American Tribe as a Native American tribe located in California that is on the contact list maintained by the Native American Heritage Commission (PRC Section 21073). A cultural landscape that meets the criteria of subdivision (a) of PRC Section 21074 is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape. Sacred places can include Native American sanctified cemeteries, places of worship, religious or ceremonial sites, and sacred shrines. Both unique and non-unique archaeological resources, as defined in PRC Section 21083.2, can be tribal cultural resources if they meet the criteria. (The criteria for eligibility for listing in the CRHR are described in detail in Chapter 3.6, *Cultural Resources*.) The lead agency relies upon substantial evidence to make the determination that a resource qualifies as a tribal cultural resource when it is not already listed in the CRHR or a local register.

Regional Setting

The study area is generally located in the central portion of Stanislaus County to the west of the City of Patterson, in the San Joaquin Valley. The San Joaquin Valley was home to a number Native American tribes prior to European and American contact. The *Native American Heritage Commission* identified three contemporary tribes that may have knowledge of cultural resources in the project area: the North Valley Yokuts Tribe, the Southern Sierra Miwuk Nation, and the Tule River Indian Tribe.

Today's North Valley Yokuts are descended from a group of tribes with an extensive aboriginal territory in the San Joaquin Valley. As many as 63 tribes of Yokuts, consisting of an estimated 35,000 people, occupied the valley from Mount Diablo in the north to the "upper reaches of the Sierra foothills." The nearest Yokuts tribe to the project vicinity may have been the Miumne. The Miumne were said to range "from the San Joaquin River west to the summit of the inner Mount Diablo range…" (Latta 1999: 1-2, 126), which encompasses the project area. No additional ethnographic research could be found to associate the Miumne with North Valley Yokuts or any specific contemporary Yokuts group. North Valley Yokuts today have a cultural representative but do not appear to have an organized tribal entity.

The Southern Sierra Miwuk occupied a territory on the western slopes of the Sierra Nevada range in the southern San Joaquin Valley, which included lands that became Yosemite National Park (Yosemite Online Library 2011). The distance from Patterson to the Yosemite Valley is more than 100 current highway miles. Today, the Southern Sierra Miwuk Nation, also known as the American Indian Council of Mariposa County (AICMC), is actively seeking federal recognition while working to educate and preserve the tribe's cultural heritage (AICMC 2019). The Southern Sierra Miwuk are also working with the National Park Service to reclaim and reconstruct a traditional settlement in Yosemite National Park from which they were ejected in the nineteenth and early twentieth centuries (Alexander 2019).

The Tule River Indian Tribe occupies a reservation in a portion of its traditional territory in the Sierra foothills near Porterville, Tulare County, about 170 miles southeast of the project area. This federally recognized tribe comprises mostly Yokuts peoples but includes descendants of other indigenous tribes that were forcibly relocated to the area from other parts of the region in the late 1800s (Frank 2014). The tribe operates a casino and several other businesses that provide employment to tribal members and support tribal operations, which include a wide range of member services (Tule River Indian Tribe 2018).

3.14.2 Regulatory Framework

This section describes laws and regulations at the state and local level that may apply to the proposed project.

Federal Policies and Regulations

There are no federal regulations for tribal cultural resources as defined by CEQA. Federal regulations applicable to cultural resources in general, including Native American archaeological and historical resources, are discussed in *Section 3.6, Cultural Resources*.

State Policies and Regulations

AB 52 (chapter 532, statutes of 2014) established policy that "a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment" under CEQA (PRC Section 21084.2). The legislation acknowledged that CEQA did not previously "directly include California Native American tribes' knowledge and concerns," which resulted in significant impacts to tribal cultural resources and sacred places. To remedy this, AB 52 established a requirement for a formal consultation process with California Native American tribes for projects subject to CEQA. AB 52 took effect on July 1, 2015 and Appendix G of the CEQA Guidelines was updated accordingly. Under AB 52, California Native American tribes must request lead agencies to notify them of proposed projects. A lead agency that receives such a request from a California Native American Tribe must notify the requesting tribe of new projects within 14 days of commencing the CEQA process. The tribe must respond to the notice and request consultation within 30 days of receipt, and the lead agency must initiate consultation within 30 days of receiving the request. This process is separate from consultation procedures under other state cultural resources laws.

Local Policies and Regulations

Stanislaus County

Stanislaus County has identified the following goals and policies relevant to tribal cultural resources in the Conservation/Open Space Element of the general plan (Stanislaus County 2016): **Goal Eight:** Preserve areas of national, state, regional, and local historical importance.

> *Policy Twenty-four:* The County will support the preservation of Stanislaus County's cultural legacy of archeological, historical, and paleontological resources for future generations.

3.14.3 Impact Analysis

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to tribal cultural resources.

To date, the Del Puerto Water District (DPWD) has not received requests any from tribes to be notified of projects under AB 52. Accordingly, no correspondence specified under the AB 52 regulations took place. However, the Native American Heritage Commission identified three tribes with potential interest in the project area: North Valley Yokuts Tribe, Southern Sierra Miwuk Nation, and Tule River Indian Tribe.

Those tribes were invited to consult on the project under CEQA requirements to assess impacts on cultural resources. As of August 27, 2019, the Southern Sierra Miwok Nation's representative had responded that the project is outside their geography of interest. The two other tribes had not responded. *Section 3.6, Cultural Resources,* provides the results of this process.

In addition, the Bureau of Reclamation is undertaking a federal Section 106 cultural resources consultation process with interested tribes and the State Historic Preservation Office (SHPO) because Reclamation may issue federal funding for the proposed project. Reclamation will prepare a NEPA document analyzing the potentially significant environmental effects of the proposed project and prepare a Section 106 consultation report.

As described in *Section 3.6,* C*ultural Resources*, research revealed eight previously identified archaeological resources present in the study area. These resources are evaluated in *Section 3.6.*

Thresholds of Significance

Consistent with Appendix G of the CEQA Guidelines, as updated in December 2018, an impact on tribal cultural resources would be considered significant if the project would cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

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

or

b. 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.

Impacts and Mitigation Measures

Impact TRIB-1 Project Would Cause a Substantial Adverse Change in the Significance of a Tribal Cultural Resource that is Listed or Eligible for Listing in the California Register of Historical Resources or Other Local Register.

Construction and Operation Impacts

The project could result in temporary or permanent construction-related impacts on tribal cultural resources during ground disturbance or permanent impacts in the proposed reservoir inundation footprint.

However, because no consultation has been requested under AB 52, no tribal cultural resources have been identified. Accordingly, there would be no impact.

Significance before Mitigation

AB52 consultation has not been requested and tribal cultural resources have not been identified; therefore, impacts would not occur.

Mitigation Measures

None.

Impact TRIB-2 Project would cause a substantial adverse change in the significance of a tribal cultural resource that is determined by the lead agency to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria, the lead agency shall consider the significance of the resource to a California Native American tribe.

Construction and Operation Impacts

See Impact TRIB-1.

Significance before Mitigation

See Impact TRIB-1.

Mitigation Measures

None.

Cumulative Impact Analysis

The geographic scope of the cumulative impacts on tribal cultural resources encompasses the study area and surrounding areas. The proposed project would not result in impacts on tribal cultural resources. As such, it would not result in an incremental contribution to a cumulatively considerable impact. Therefore, when combined with other projects listed in **Table 3.0-1** it would not result in a cumulatively considerable significant impact.

Significance Determination

No Impact.

Mitigation Measures

None.

3.14.4 References

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3.15 Utilities and Service Systems

This section evaluates the potential impacts to utilities and service systems (i.e., water, wastewater, storm drainage, solids waste, natural gas, telecommunication, and electrical services) associated with implementation of the proposed project. For the purpose of this analysis, the study area includes utilities and service systems in the vicinity of the facilities to be constructed or modified under the proposed project. As determined in the Initial Study, water supply, wastewater, storm drainage, and solids waste criteria are not applicable to actions associated with the project (see discussion in *Section 3.15.3, Impact Analysis, Criteria Requiring No Further Evaluation*).

The project does require the relocation of utilities including five existing and one proposed high-voltage electric transmission lines, fiber-optic cable lines, a buried telecommunication cable, and a petroleum transmission pipeline, the impacts of which are discussed herein.

3.15.1 Environmental Setting

The discussion below describes the conditions of the region and study area related to utilities and service systems.

Regional Setting

Stanislaus County is served by a number of private companies and publicly owned enterprises that provide essential public services including electricity, natural gas, and telecommunication services. Three electric utility providers deliver electricity to the area: Pacific Gas and Electric (PG&E), which operates on a regional scale throughout northern and central California, and Modesto Irrigation District (MID) and Turlock Irrigation District (TID), which operate on a smaller scale to serve customers within their service areas. PG&E delivers natural gas received from large-capacity pipelines to individual customers through small-diameter distribution pipelines (County Office 2019; Stanislaus County 2016).

The region is also traversed by interstate and intrastate pipelines that transport natural gas and petroleum products, as well as large-scale power transmission lines for long-distance transmission of electricity. Major utilities with facilities located in the project study area are described below. MID and TID do not have utility infrastructure within the project area that would be affected by project construction.

Pacific Gas and Electric

PG&E, which incorporated in California in 1905, is one of the largest combined natural gas and electric energy companies in the United States, providing natural gas and electric service to approximately 16 million people throughout a 70,000-square-mile service area in northern and central California (PG&E 2019). PG&E owns and operates 106,681 circuit miles[1] of electric distribution lines and 18,466 circuit miles of interconnected transmission lines. Additionally 42,141 miles of natural gas distribution pipelines and 6,439 miles of transmission pipelines support the transportation and distribution of natural gas within their service area. Like other energy companies in the state, PG&E is regulated by the California Public Utilities Commission (CPUC).

Shell Pipeline Company

Shell Pipeline Company, a subsidiary to Shell Oil North America, has transported energy resources in the United Stated for 100 years. Shell Pipeline currently transports more than 1.5 billion barrels of crude oil and refined products annually through 3,800 miles of pipeline. Through various ownership agreements with other pipeline operators, Shell Pipeline has added an additional 8,000 pipeline miles to their portfolio. Shell's interstate pipelines deliver over 12.9 billion barrels (542 billion gallons) of petroleum products each year. About 59 percent of the petroleum products transported by pipelines is crude oil and

[1] Circuit mile: the total length in miles of separate circuits regardless of the number of conductors used per circuit (U.S. Energy Information Administration 2019).

the remainder is in the form of refined petroleum products. Pipelines also transport the refined products to regional and local distribution centers, where products are loaded onto tanker trucks for further transportation (Shell Pipeline Company 2019).

Frontier Communications Corporation

Frontier Communications Corporation is a major provider of telecommunication services, including internet, television, and phone services, in operation in 29 U.S. states (Frontier 2019). Frontier Communications currently has service coverage in almost every census block in the City of Patterson, with coverage of 92 percent of the city's footprint (BroadbandNow 2019). Frontier also serves customers in unincorporated Stanislaus County, including two customers on Del Puerto Canyon Road who are served by a buried cable line along the road.

Project Vicinity

The study area is generally located in the western portion of Stanislaus County to the west of the City of Patterson. Existing utilities run north-south across the reservoir site, including five high-voltage electric transmission lines owned by PG&E, fiber-optic cable lines, a petroleum pipeline owned and operated by Shell Pipeline, a buried telecommunication cable owned by Frontier Communications Corporation. In addition to existing utilities, the San Luis Transmission Project, which includes a 500 kilovolt (kV) transmission line that would be owned and operated by Western Area Power Administration, is currently proposed to cross the project area.

The location of existing utilities within the project vicinity is shown in **Figure 3.15-1**. As shown, the existing utility corridor and planned San Luis Transmission Project crosses directly through the proposed project area, running approximately parallel to Interstate 5. Twelve powerline towers are located within footprint of proposed project.

3.15.2 Regulatory Framework

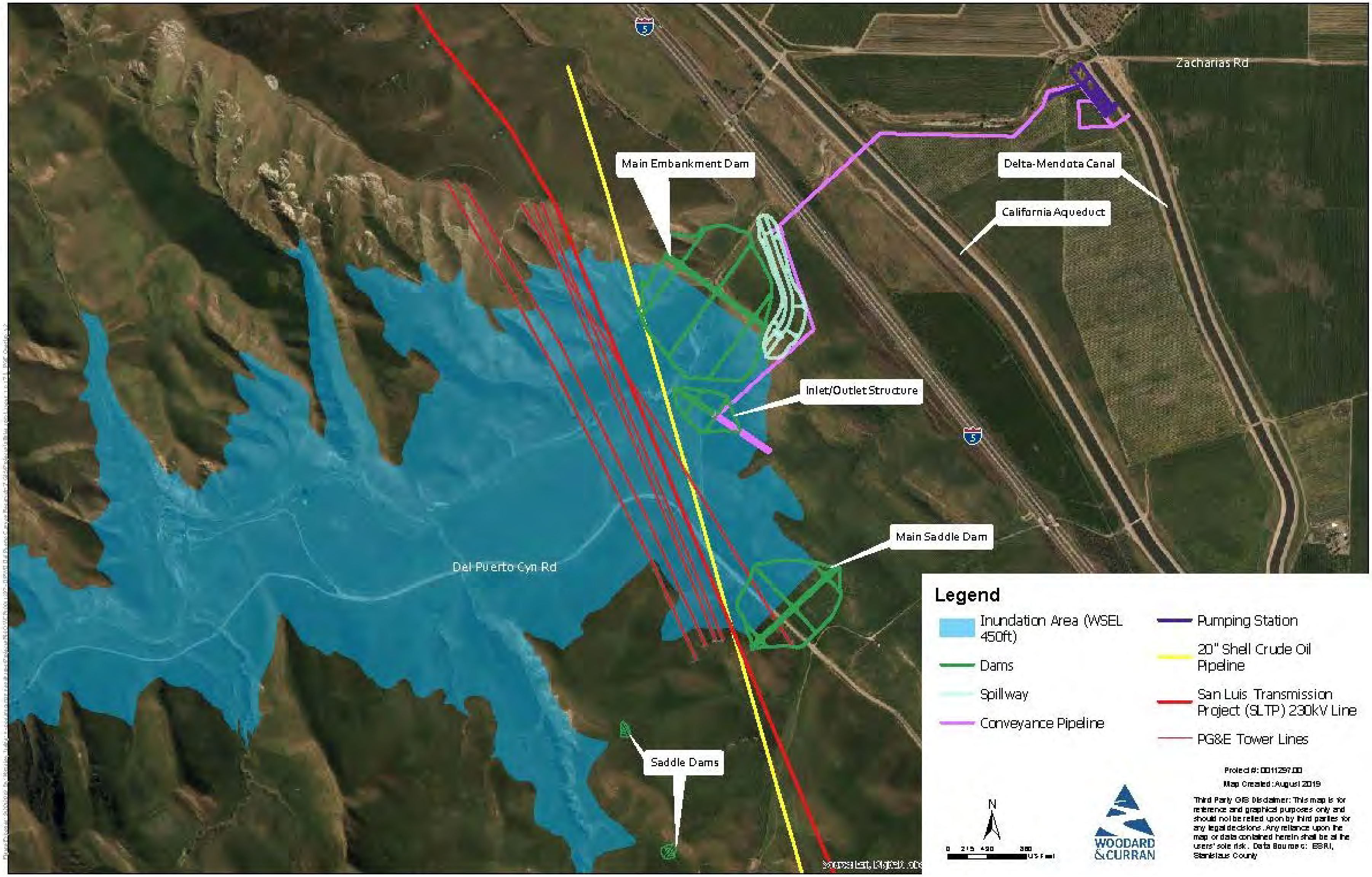
This section describes laws and regulations at the federal, state, and local level that may apply to the project.

Federal Policies and Regulations

Federal Power Act

The Federal Power Act established the Federal Energy Regulatory Commission (FERC) as an independent agency to regulate the interstate transmission of electricity, natural gas, and oil. FERC additionally reviews proposals to build liquefied natural gas terminals and interstate natural gas pipelines as well as licensing hydropower projects. The Federal Power Act was amended with the Energy Policy Act of 2005 to include reliability standards following a massive power outage in 2003 that affected 55 million people in the Unites States and Canada (United States Code §§ 792 et seq., amended 2005). The Energy Policy Act of 2005 expanded FERC's responsibilities to include protecting the reliability of the high voltage interstate transmission system through mandatory reliability standards, ensuring the safe operation and reliability of proposed and operating liquified natural gas terminals, and regulating the transportation of oil by pipeline in interstate commerce (FERC 2006).

Figure 3.15-1: Utilities within Reservoir Inundation Area



North American Electric Reliability Corporation Reliability Standards

The North American Electric Reliability Corporation (NERC) is an electric reliability organization certified by FERC to establish and enforce reliability standards for the Bulk Power System.[2] NERC provides oversight for many reliability standards including resource and demands balancing; critical infrastructure protection; emergency preparedness and operations; facilities design, connections, and maintenance; interchange scheduling and coordination; interconnection reliability operations and coordination; modeling, data, and analysis; personnel performance, training, and qualifications; protection and control; transmission operations; and transmission planning (NERC 2019b).

State Policies and Regulations

California Public Utilities Commission

The CPUC regulates services and utilities to protect consumers, safeguard the environment, and assure access to safe and reliable utility infrastructure and services. The essential services regulated include electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. The CPUC's energy work responsibilities are derived from the California State Constitution, Article XII, Section 3 and other sections more generally, as well as state legislative enactments and federal statutory and administrative requirements (CPUC 2019). The CPUC establishes general orders, standards, procedures, and guidelines, including General Order 95: Rules for Overhead Electric Line Construction (Decision No. 18-05-042), which provides detailed construction requirements for electric supply lines, towers, and extra-high voltage lines (CPUC 2018).

Local Policies and Regulations

City of Patterson General Plan

GOAL PS-1: To maintain an adequate level of service in the City's water system to meet the needs of existing and future development.

> **Policy PS-1.4 Agency coordination.** The City shall coordinate, to the extent feasible, with other agencies involved in water resource development in the region.

3.15.3 Impact Analysis

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to utilities and service systems. Potential impacts were analyzed based on the potential for the proposed project to require or result in the relocation or construction of new or expanded water, wastewater, treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities. The evaluation of temporary or short-term impacts considers whether construction activities could substantially degrade the utility service to the surrounding area, as well as the duration over which any such changes would occur.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines*, as updated in December 2018 an impact on utilities and service systems would be considered significant if the project would:

[2] The bulk power system refers to facilities and control systems necessary for operating an interconnected electric energy supply and transmission network (or any portion thereof), and electric energy from generating facilities needed to maintain transmission system reliability. The term does not include facilities used in the local distribution of electric energy (NERC 2019a).

- 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;
- Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years;
- 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;
- 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;
- Comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

Criteria Requiring No Further Evaluation

The Initial Study determined that the project would not have significant impacts associated with the following criteria:

- Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years;
- 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;
- 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;
- Comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

Impacts and Mitigation Measures

Impact UTL-1 Require Relocation of Electric Power, Natural Gas, and Telecommunication Facilities, the Construction or Relocation of Which May Cause Significant Environmental Effects

The project would require the relocation of existing utilities that currently run north-south through the project area, including the five high-voltage transmission lines, a petroleum pipeline, and telecommunication cable. In addition, the proposed San Luis Transmission Project transmission line would be affected by the proposed reservoir and would require adjustment. See **Figure 2-7** (*Section 2.2.4*) for the location of the potential utility realignment.

All utility work would be coordinated with utility owners to minimize temporary construction-related impacts, including any temporary disruption in service (which is not anticipated); however, the relocation itself is a necessary component of the project, the impacts of which are evaluated throughout this EIR. Environmental impacts to the utility relocation component of the proposed project are discussed in the following sections: *Aesthetics (Section 3.1), Agricultural and Forestry Resources (Section 3.2), Air Quality (Section 3.3), Biological Resources (Sections 3.4 and 3.5), Cultural Resources (Section 3.6), Energy Resources (Section 3.7), Geology and Soils (Section 3.8), Greenhouse Gas Emissions (Section 3.9), Hazards and Hazardous Materials (Section 3.10), Land Use and Planning (Section 3.12), Transportation and Traffic (Section 3.13), and Tribal Cultural Resources (Section 3.14)*.

Power Lines

As described in the Project Description, if feasible, powerline towers would be reconfigured to enable the existing powerlines to cross over the reservoir pool. If infeasible, the powerlines and other utilities would be relocated to the front of the main dam, and 28 powerline towers located within the reservoir footprint would need to be relocated. If the powerlines are relocated in front of the dam it is estimated that up to 47 new steel towers and 30 wooden poles may need to be constructed to support the relocation of the five transmission lines, as the longer, curved pathway is expected to result in a 75 percent increase in powerline length within the project vicinity.

Tubular steel monopoles or lattice steel structures would be used to support the relocated transmission lines and could range in height from 50 feet to 170 feet depending on the actual size of the line to be constructed (e.g., 115-kV, 230-KV or 500-kV). Smaller voltage lines could be constructed on wooden poles. Disruption in electrical service is not anticipated as the project would not take down powerlines until the new powerlines are in place to replace them. PG&E is being consulted and has designed a strategy to bridge the connection from the old lines to the new lines in a way that will not interrupt service. Additionally, the transition will be timed to be completed at off-peak power demand.

Petroleum Pipeline

The project would require relocation of approximately several thousand feet of petroleum pipeline. The relocated pipeline would be approximately 9,000 feet in length, 20 inches in diameter, and made of welded steel with dielectric coating, fabricated in coordination with the current owner (Shell Pipeline) or its future owner. The trench would be backfilled with native soils, and the construction easement restored to its original condition following relocation.

Telecommunication Lines

The project would require relocation of the buried telecommunication cable that currently runs along the existing alignment of Del Puerto Canyon Road to run along the relocated Del Puerto Canyon Road. Ancillary communication facilities, including fiber optic overhead ground wires would be installed on the transmission line structures for control and protection.

Significance before Mitigation

The nature of the project requires the relocation and reconstruction of electric power, and telecommunications facilities, would have significant environmental impacts. Because the relocation of utilities is critical for the proposed project to proceed, the impact is considered significant and unavoidable. Subsequent environmental impacts associated with the utility relocation component of the project (e.g., aesthetic impacts), where significant, are addressed through mitigation measures identified in other sections of this EIR and are referenced below.

Construction related impacts would be temporary in nature and would be minimized through coordination with utility owners and by following transition procedures such that service remains largely uninterrupted. As such, short-term disruption impacts would be considered less than significant.

Mitigation Measures

Mitigation measures for impacts associated with the utility relocation are identified in other sections of this EIR, and are summarized in **Table ES-1**, in the *Executive Summary* Section.

No mitigation measures beyond those identified elsewhere in this EIR are proposed.

Significance after Mitigation

Relocation of utilities would contribute to significant unavoidable construction-period impacts associated with construction traffic and GHG emissions during construction; relocation of utility lines would contribute to unavoidable loss of agricultural land and also has the potential to contribute to significant impacts to cultural resources. Explanation of how mitigation measures would reduce impacts in other resource areas to less than significant is discussed in the chapters referenced above.

Because the existing and planned utilities cross directly through the footprint of the reservoir inundation area, their relocation is necessary for the project's construction. It is therefore not possible to fully mitigate the relocation itself, and thus the impact would be significant and unavoidable.

Cumulative Impact Analysis

The geographic scope of the cumulative impacts on utilities and service systems encompasses the study area and surrounding areas. If the proposed project, as well as other projects listed in **Table 3.0-1**, would adversely affect the same utility resources, a significant cumulative impact could result. The following projects were identified as having a potential nexus with the project:

- City of Patterson Water Master Plan: evaluated 13 water supply options.
- San Luis Transmission Project: new high voltage transmission line adjacent to existing transmission line corridor.

The City of Patterson Water Master Plan evaluates water supply options for the city and is unlikely to result in the relocation of electric power, petroleum, and telecommunications facilities. New supply projects identified in the Water Master Plan include new groundwater wells, stormwater capture, and the addition of tertiary filtration to the existing Patterson Water Quality Control Facility. According to the Plan, the exact siting of each new well, and the sizing and location of the stormwater capture areas will be determined based on a review of potential impact on surrounding infrastructure (City of Patterson 2018) and would thus aim to avoid the relocation of existing utility facilities. The San Luis Transmission Project crosses directly through the proposed reservoir inundation area, and the proposed project would require the relocation of the proposed alignment. The impacts from the San Luis Transmission Project are already considered in this analysis and are discussed above.

Significance Determination

The proposed project along with other cumulative projects would result in a cumulatively considerable contribution impacts associated with the relocation of electric power, and telecommunications facilities in and surrounding the study area, the relocation of which could cause significant environmental effects. As such, the cumulative impact is considered significant and unavoidable.

3.15.4 References

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3.16 Environmental Justice

3.16.1 Regulatory and Environmental Setting

The CEQ's guidance document on environmental justice under NEPA (CEQ, 1997), in referencing Executive Order 12898, states that "each federal agency should analyze the environmental effects, including human health, economic, and social effects of Federal actions, including effects on minority populations, low-income populations, and Indian tribes, when such analysis is required by NEPA."

According to USEPA guidelines, a minority population is present in a study area if the minority population of the affected area exceeds 50 percent, or if the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. The project would be located in unincorporated Stanislaus County to the west of the City of Patterson in Census Tract 33. In 2017, Census Tract 33 has an estimated population of 5,818 (+/-498) with an estimated 88 percent self-identifying as white. **Table 3.16-1** includes the statistics for the proposed project's census tract (US Census Bureau, 2019). Therefore, the project area is not composed of a minority population exceeding 50 percent.

Table 3.16-1: Summary of Race Statistics for Stanislaus County Census Tract 33, 2017 Data

Race	Population Estimate	Margin of Error
White alone	5,103	+/- 580
Black or African American Alone	131	+/- 93
American Indian and Alaska Native alone	0	+/- 17
Asian alone	81	+/- 70
Native Hawaiian and Other Pacific Islander alone	0	+/- 17
Some other race alone	394	+/- 248
Two or more races total	109	+/- 88
Two races including some other race	4	+/- 8
Two races excluding some other race, and three or more races	105	+/- 87
Total Population	**5,818**	**+/- 498**

USEPA guidelines recommend that analyses of low-income communities consider U.S. Census Bureau poverty level definitions, and applicable State and regional definitions of low-income and poverty communities. <u>For 2019, the U.S. Census Bureau defines the poverty threshold for a family of four with two children as $25,926, with higher income thresholds for larger families. Poverty metrics defined by DWR are the applicable State and regional definitions of low-income and poverty communities.</u> DWR defines a Disadvantaged Community (DAC) as a community with a median household income (MHI) less than 80 percent of the California MHI and a Severely Disadvantaged Community (SDAC) is a community with an MHI less than 60 percent of the California MHI. According to 2013 to 2017 census data, the statewide MHI was $67,169. A DAC would therefore be a community with an MHI of $53,735 or less and a SDAC would be a community with an MHI of $40,301. <u>The DWR definitions are more conservative than the U.S. Census Bureau poverty thresholds, because they reflect the high cost of living in California. DWR metrics are thus used for this analysis. U.S. Census Bureau</u> American Community Survey data from 2017 state that the MHI of Census Tract 33 is $47,596, which classifies the proposed project area as a DAC.

The proposed project site, as described in *Section 3.12, Land Use and Recreation*, is surrounded by agricultural fields and grazing lands. There are three potential sensitive receptors in proximity to the proposed project site (see **Figure 3.3-1** in *Section 3.3, Air Quality*).

3.16.2 Impact Analysis

For the purposes of this analysis, an impact related to environmental justice would be significant if the proposed project would cause impacts to minority or low-income populations that are disproportionately high and adverse, either directly, indirectly, or cumulatively.

Although the construction of the dams, pipelines, road alignment, and utility re-alignment has the potential for short-term environmental effects as described in this document, (e.g., short term impacts on air quality, noise, hazards/hazardous materials, traffic), the proposed project would more likely benefit low-income and minority populations in the study area by providing a long-term source of water and thereby stabilizing the agricultural labor market. The Project would also generate short-term employment opportunities during construction.

Although construction would generate impacts (e.g., dust, traffic, and noise), such activities would be intermittent and temporary, and would cease upon completion of work activities. As discussed above, three potential sensitive receptors were identified in proximity to the proposed project site. However, these potential sensitive receptors are far from the dam component where the majority of impacts would occur and are located closer to the potential road alignment and pipeline alignment. Where potential impacts would occur, mitigation measures have been identified to reduce such effects to less-than-significant levels. Therefore, with the consideration of the benefits provided to these communities through implementation of the proposed project and implementation of mitigation included in this document, the proposed project would not result in any disproportionately high adverse impacts on minority or low-income communities. Thus, no adverse environmental justice impacts would occur.

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3.17 Indian Trust Assets

This section evaluates the potential impacts on Indian Trust Assets associated with implementation of the proposed project. For the purpose of this analysis, the study area includes Indian Trust Assets in the vicinity of the facilities to be constructed or modified under the proposed project as identified in Chapter 2, *Description of the Proposed Project*.

3.17.1 Environmental Setting

The study area is generally located in the western portion of Stanislaus County to the west of the City of Patterson. There are no Indian Trust Assets in the study area. The nearest Indian Trust Asset is the Chicken Ranch Rancheria, about 50 miles to the northeast of the project area (Clancy 2019). The definition of Indian Trust Assets is provided in *Section 3.17.2, Regulatory Framework*, below the table.

3.17.2 Regulatory Framework

Regulations relative to the proposed project and Indian Trust Assets are described below. There are no state or local regulations or policies related to Indian Trust Assets, only federal requirements.

Federal Policies and Regulations

The U.S. Government's trust responsibility for Indian resources requires U.S. Bureau of Reclamation (Reclamation) and other agencies to take measures to protect and maintain trust resources. These responsibilities include taking reasonable actions to preserve and restore tribal resources, including evaluating the potential for impacts to these resources.

Indian Trust Assets are defined as legal interests in property held in trust by the United States for federally recognized Indian tribes or individual Indians. There are three components to an Indian trust: the trustee, the beneficiary, and the trust asset. The United States serves as the trustee for Indian Trust Assets, and the beneficiaries are the Indian tribes or the individual Indians for which the property is held in trust. The trust asset may include land, minerals, federally reserved hunting and fishing rights, federally reserved water rights, and instream flows associated with trust land. Because the United States holds this property in trust, Indian Trust Assets cannot be sold, leased, or otherwise encumbered without the approval of the United States. The United States has an Indian trust responsibility to protect and maintain rights reserved by or granted to Indian tribes or Indian individuals through treaties, statutes, and executive orders. The characterization and application of the U.S. trust relationship have been defined by case law that interprets Congressional acts, executive orders, and historic treaty provisions (USBR, 2019).

Consistent with President William J. Clinton's 1994 memorandum, "Government-to-Government Relations with Native American Tribal Governments," Reclamation and other federal agencies assess the effects of its programs on Indian trust resources. Reclamation is required to actively engage federally recognized tribal governments and consult with such tribes on government-to-government level when its actions affect Indian Trust Assets (Federal Register, 1994). The U.S. Department of the Interior (Interior) Departmental Manual Part 303.2 (2000a) ascribes the responsibility for ensuring protection of Indian Trust Assets to the heads of bureaus and offices. Interior is required to "protect and preserve Indian trust assets from loss, damage, unlawful alienation, waste, and depletion" (Interior, 2000b). It is the general policy of Interior to perform its activities and programs in such a way as to protect Indian Trust Assets and avoid adverse effects whenever possible.

Reclamation complies with procedures contained in Departmental Manual Part 303.2. Reclamation carries out its activities in a manner that protects trust assets and avoids adverse impacts when possible. When Reclamation cannot avoid adverse impacts, it will provide appropriate mitigation or compensation. Reclamation is responsible for assessing whether the Project has the potential to affect Indian Trust Assets.

3.17.3 Impact Analysis

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to Indian Trust Assets. Reclamation maintains geographic information system (GIS) coverage of Indian reservations and rancherias for the State of California. The impact assessment for Indian Trust Assets was based on this GIS coverage and maps of Indian Trust Assets in the study area.

Thresholds of Significance

To address environmental consequences related to Indian Trust Assets, the following issues have been evaluated to determine potential impacts and their level of significance:

- Are Indian Trust Assets present in or adjacent to the study area?
- If an Indian Trust Asset is present, would the proposed project impede, change, or potentially benefit current activities within the Indian Trust Asset?

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to the proposed project are identified below along with a supporting rationale as to why further consideration is unnecessary.

- *Affect Indian Trust Assets* – The proposed project does not have a potential to affect Indian Trust Assets. The nearest Indian Trust Asset is the Chicken Ranch Rancheria, approximately 50 miles northeast of the study. Since there are no Indian Trust Assets within the study area, further evaluation is not necessary.

3.17.4 References

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Chapter 4 Alternatives

The following discussion evaluates alternatives to the proposed Project and examines the potential environmental impacts associated with each alternative. Through comparison of these alternatives to the proposed Project, the relative environmental advantages and disadvantages of each are identified.

4.1 CEQA Requirements for Alternatives Analysis

CEQA Guidelines Section 15126.6 requires EIRs to evaluate a range of reasonable alternatives to a project, or to the location of a project that would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project, rather it must consider a reasonable and realistic range of potentially feasible, and alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible candidate alternatives that do not meet all of the criteria below may be excluded from the EIR.

- The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. The range of alternatives addressed in an EIR should be governed by a rule of reason. When addressing feasibility, factors that may be taken into account may include site suitability, economic viability, availability of infrastructure, other plans or regulatory limitations, jurisdictional boundaries, and the proponent's ability to reasonably acquire, control, or otherwise have access to an alternative site.
- Evaluation is to focus on those alternatives capable of either avoiding or substantially lessening any significant environmental effects of the project, even if the alternative would impede, to some degree, the attainment of the project objectives, or would be more costly.
- The EIR should identify alternatives that were considered by the lead agency but were rejected as infeasible and the reasons for the lead agency's determination (Section 15126.6(c)).
- A "No Project" alternative must be evaluated. If the environmentally superior alternative[1] is the "no project" alternative, the EIR must also identify an environmentally superior alternative among the other alternatives. (Section 15126.6(e)).

In general, there are two types of alternatives that may be reviewed in an EIR, depending on the nature of the project: (1) alternatives to the project that are other projects entirely, or other approaches to achieving the project objectives rather than the project or modified project; and (2) alternative configurations of the project that include modified project components, such as alternative project sites or processes and/or modified facilities, layout, size, and scale. The discussion should not consider those alternatives whose implementation is remote or speculative, and the analysis need not be presented in the same level of detail as the assessment of the proposed project.

In accordance with CEQA Guidelines, several factors should be considered in determining the range of alternatives to be analyzed in an EIR and the level of analytical detail that should be provided for each alternative. These factors include:

1. The potential for the proposed project to result in significant impacts;
2. The ability of alternatives to reduce or avoid significant impacts of the proposed project;
3. The ability of the alternatives to meet most of the objectives of the proposed project; and

[1] The environmentally superior alternative is generally defined as the alternative that would result in the least adverse environmental impacts to the project site and surrounding area. Identification of the environmentally superior alternative typically includes consideration of trade-offs and weighting. For example, short-term construction impacts are typically accorded less weight than long-term operational effects.

4. Factors other than project objectives affecting the potential feasibility[2] of the alternatives.

4.2 Project Objectives

As described in *Chapter 1, Introduction*, the specific project objectives are:

- Increase south of Delta water storage capacity in California's Central Valley by 80,000 AF;
- Provide local water storage in proximity to the DMC and to users;
- Improve water supply reliability;
- Increase peak irrigation season water supplies;
- Improve the ability to manage regional surface and groundwater resources;
- Improve regional self-reliance and economic benefit from agricultural production, jobs, and industry multipliers;
- Develop a cost-effective project that provides water at an affordable cost to landowners; and
- Avoid displacement of homes and businesses.

4.3 Key Impacts of the Proposed Project

Chapter 3 of this EIR identifies potential impacts associated with the proposed Project for each environmental issue area in Appendix F and Appendix G of the CEQA Guidelines, including long-term and short-term impacts. A range of potential alternative configurations of the Project were analyzed such that the considered alternatives would meet the Project's objectives and maximize the Project's benefits at the most reasonable cost while minimizing Project impacts. Mitigation measures are identified to render any impacts less than significant if possible. Possibly significant impacts from Project construction and/or operation were identified during the impact analyses; however, mitigation measures were identified that, when implemented, would reduce most impacts to less than significant. A summary of the significance of the impacts for each environmental resource analyzed in Chapter 3 is presented at the end of this chapter in **Table 4-11**. The table does not include impacts or criteria that were deemed not applicable to construction or operation of the proposed Project, or for which no impact was identified.

Based on analysis conducted as part of the environmental review, it was determined the proposed project has the potential to result in the following significant unavoidable impacts:

- visual impact because the dam would obscure views of the Del Puerto Canyon from I-5 and change the visual character of the lower portion of the canyon;
- effects on cultural resources
- GHG emissions impacts;
- construction traffic impacts; and
- impacts associated with the need to relocate utilities.

[2] The issue of feasibility arises at two different junctures: (1) in the assessment of alternatives in the EIR and (2) during the agency's later consideration of whether to approve the project. Differing factors come into play at each stage or phase. For the EIR inclusion phase, the standard is whether the alternative is *potentially* feasible, and for the final decision on the project approval phase, as required by CEQA, the decision-making body evaluates whether the alternatives are *actually* feasible and may at this phase reject as infeasible alternatives that were identified in the EIR as potentially feasible. (*California Native Plant Society v. City of Santa Cruz* (2009) 177 Cal.App.4th 957, 981, citing *Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal.App.4th 477, 489.)

4.4 Alternatives Development Process

Alternatives were considered during the preparation of the Feasibility Study (AECOM 2016). The feasibility study considered three potential locations for the dam and three possible sizes for the reservoir.

Reservoir alternatives were evaluated against the following criteria to determine the alternatives to carry forward for further analysis:

- Acceptability of location for dam foundation
- Property and utility impacts
- Reservoir rim stability
- Quantity of material needed for dam
- Cost effectiveness

The Feasibility Study recommended implementation of the proposed project. This EIR evaluates three alternatives:

- Reservoir sizing: 40,000 AF reservoir size
- Ingram Canyon Reservoir site
- No project: Additional groundwater pumping to meet project objectives

4.5 Water Supply Alternatives Considered but Rejected

4.5.1 Additional Conservation

The Project Partners have worked for years to conserve water resources and maximize efficiency of their irrigation practices. Nearly all of the permanent crops and many of the row crops grown in the DPWD service area are irrigated by high-efficiency sprinkler or drip irrigation systems. DPWD supports conservation efforts by providing low interest loan funding for the installation of high efficiency irrigation systems, including both micro-sprinkler and drip emission systems. Similarly, the Exchange Contractors are dedicated to conservation and sustainable use of water. The members of the Exchange Contractors invest in conservation programs, assist farmers undertaking conservation projects with low interest loans and grants, work to improve on-farm irrigation practices, and invest in new canal delivery technology to conserve water. Without access to dispatchable storage, conservation to increase water supply reliability is not feasible. Conservation efforts will continue but would not meet project objectives to develop local water storage to enable better management of existing supplies.

4.5.2 Water Transfers

DPWD has used water transfers during times of water shortage but buying enough water to keep crops growing through temporary transfers has become more difficult every year. The cost of purchasing water is steadily increasing while the availability of water is decreasing. Because availability of water is uncertain, water transfers do not increase water supply reliability, and the increasing cost of transfers does not meet the objective to develop a cost-effective project. Additional local storage is needed to provide optimal management for all available water supplies and without storage, water transfers may not meet local needs, even if water was available and affordable. The Project Partners will continue to use water transfers as appropriate, but transfers would not meet any of the objectives of the project.

4.5.3 Groundwater Storage

Both Project Partners are pursuing projects for groundwater recharge and storage, but these projects would not replace the need for surface water storage. The Project Partners are jointly developing a project for recharge and recovery on Orestimba Creek, and the Exchange Contractors are developing a similar project on Los Banos Creek. Surface storage must be combined with groundwater storage to meet project objectives for increasing water storage so as to effectively manage existing supplies. The Project Partners will continue to pursue groundwater storage, but this would not replace the need for surface storage.

4.6 Reservoir Site Alternatives Considered but Rejected

The partners considered several alternative storage locations potentially capable of achieving the project purpose and meeting the Project objectives discussed above.

4.6.1 Alternatives Selection

There have been multiple studies on possible reservoir sites South of the Sacramento-San Joaquin Delta. The Department of Water Resources 1996 *Alternative South-of-the-Delta Offstream Reservoir Reconnaissance Study, Phase One* (Study) study identifies 96 dam sites located south of the Delta. A wide range of storage capacities was analyzed for each reservoir site, resulting in almost 180 different alternatives. This Study was used as a basis for the screening and analysis outlined below.

4.6.2 Screening Process

To narrow the alternatives, the partners applied two screening criteria:

1) Location in relation to the Sacramento-San Joaquin Delta and San Luis Reservoir; and
2) Storage capacity.

Sites only advanced to the analysis stage if they were located south of the Sacramento-San Joaquin Delta and north of San Luis Reservoir. This screen narrowed the 96 potential reservoir sites to fourteen possible reservoir sites:

1. Deep Gulch	2. Salado Creek
3. Lone Tree Creek	4. Oso Creek
5. Hospital Creek	6. Orestimba Creek
7. Ingram Canyon	8. Garzas Creek
9. Kern Canyon	10. Quinto Creek
11. Del Puerto Canyon	12. Mustang Creek
13. Little Salado/Crow Creek	14. Romero Creek

Figure 4-1 shows the 14 sites selected for further analysis.

When considering different capacity sizes, the remaining fourteen sites had between them 68 varying storage capacity alternatives. To further narrow the list of alternatives, the partners applied a second screen related to storage capacity. Alternatives were screened out if they had storage capacities less than 50 TAF or greater than 150 TAF. This resulted in three sites being screened out. The remaining 11 alternatives that advanced to the analysis stage are listed in **Table 4-1**.

Figure 4-1: Reservoir Alternatives South of the Delta (North of San Luis Reservoir)

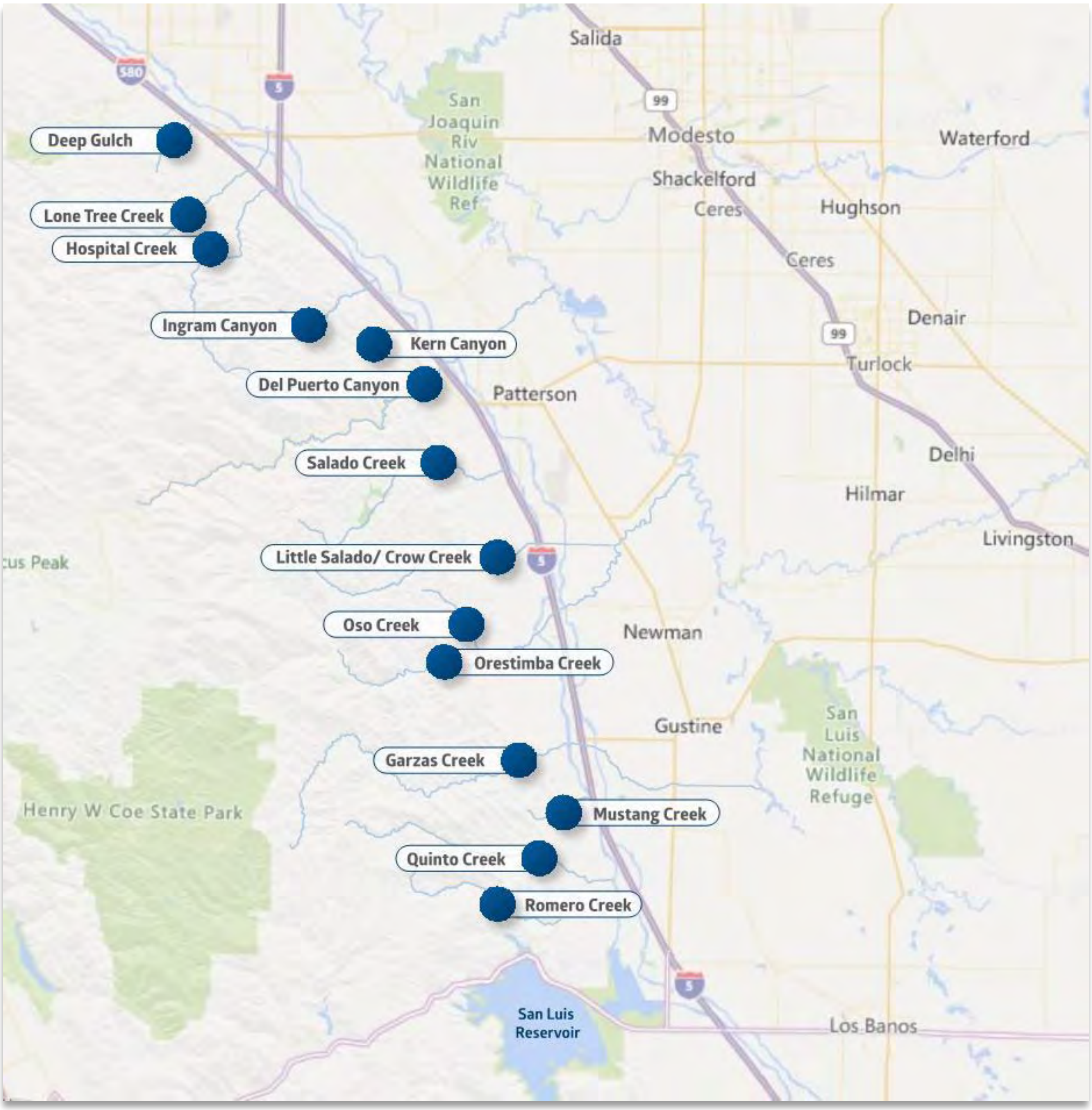

Table 4-1: Reservoir Alternatives Considered

Reservoir Alternative	Capacity (TAF)
Deep Gulch	58
Del Puerto Canyon [1]	88
Garzas Creek	86
Ingram Canyon	67
Little Salado Creek/Crow Creek	132
Lone Tree Creek 4	63
Orestimba Creek 5	75
Oso Creek 2	83
Quinto Creek 3	113
Romero Creek 2	88
Salado Creek 1	78

[1] Capacity is reported as estimated in the original DWR report; capacity of DPCR is now estimated to be 82 TAF

4.6.3 Alternatives Analysis Stage

The criteria used for evaluating the selected 11 alternatives (**Table 4-1**) include the ratio of storage capacity to physical features of the dam and reservoir. This includes reservoir surface area, dam embankment volume, and dam height. Each of these features has an associated cost and environmental impact. The most efficient project has the greatest water storage capacity with the lowest surface area, dam embankment volume, and dam height and with the least operational energy cost for pumping. Energy demand is also directly related to operational GHG emissions. The alternatives were ranked 1-11, with higher ratios ranked 1 and lower ratios ranking 11.

Capacity to Surface Area Ratio

The inundation area of a reservoir is one of the impacts of a reservoir project. Existing land use including farming/grazing, habitat, recreation, roads, structures within the inundation area would be displaced by the inundation of this land. The less surface area of the reservoir, the less evaporative losses there will be as well. The sites best suited for a reservoir will have the lowest inundation area to storage capacity possible so as to reduce the impacts associated with inundation and evaporation. The reservoir alternatives were ranked (1 to 11) based on their storage capacity (TAF) to inundation surface area (acres) as shown in **Table 4-2**. The top five highest ranking reservoirs include Ingram Canyon, Oso Creek, Lone Tree Creek, Del Puerto Canyon, and Orestimba Creek.

Table 4-2: Capacity to Surface Area Ratio Ranking

Alternative	Capacity (TAF)	Surface Area (acres)	Capacity to Surface Area Ratio	Capacity to Surface Area Rank
Ingram Canyon	67	633	0.106	1
Oso Creek	83	785	0.106	2
Lone Tree Creek	63	639	0.099	3
Del Puerto Canyon	88	897	0.098	4
Orestimba Creek	75	775	0.097	5
Salado Creek	78	825	0.095	6
Deep Gulch	58	634	0.091	7
Garzas Creek	86	969	0.089	8
Romero Creek	88	1054	0.083	9
Quinto Creek	113	1738	0.065	10
Little Salado Creek/Crow Creek	132	2910	0.045	11

Capacity to Dam Embankment Volume Ranking

Each site was then evaluated based on the dam embankment volume. The greater the embankment volume, the higher the cost of material to build the dam. A greater dam embankment volume also results in additional impacts associated with transporting embankment material to the site. The site alternatives were ranked (1 to 11) based on their storage capacity (TAF) to dam embankment volume in million cubic yards (CY) as shown in **Table 4-3**. The top five highest ranking reservoirs include Lone Tree Creek, Orestimba Creek, Del Puerto Canyon, Little Salado/Crow Creek, and Garzas Creek.

Capacity to Dam Height Ranking

This criterion is included to reflect the potential engineering difficulties and safety concerns associated with taller dams, as well as visual impacts of the dam. Sites that require taller dams to achieve the same water storage as a shorter dam are ranked lower. The site alternatives were ranked (1 to 11) based on their storage capacity (TAF) to dam height (feet) as shown in **Table 4-4**. The top five highest ranking reservoirs include Little Salado/Crow Creek, Quinto Creek, Romero Creek, Orestimba Creek and Del Puerto Canyon.

Distance to Delta Mendota Canal and Operational Energy Cost Ranking

This criterion is included to represent the potential infrastructure necessary to connect the proposed reservoir to the Delta Mendota Canal (DMC) and the operational energy requirements and associated GHG emissions. The closer the reservoir is to the DMC, the lower the costs and impacts of this infrastructure will be and the less energy would be required to convey water to and from the reservoir. The site alternatives were ranked (1 to 11) based on the distance away from the DMC (miles) as shown in **Table 4-5**. The top five highest ranking alternatives include Del Puerto Canyon, Little Salado Creek/Crow Creek, Ingram Canyon, Romero Creek, and Lone Tree Creek.

Table 4-3: Capacity to Dam Embankment Volume Ranking

Alternative	Capacity (TAF)	Dam Embankment Volume (million CY)	Capacity to Dam Embankment Volume Ratio	Capacity to Dam Embankment Volume Ranking
Lone Tree Creek	63	1.5	42.0	1
Orestimba Creek	75	3.6	20.8	2
Del Puerto Canyon	88	6.2	14.2	3
Little Salado Creek/Crow Creek	132	11.5	11.5	4
Garzas Creek	86	8.3	10.4	5
Ingram Canyon	67	7.2	9.3	6
Romero Creek	88	9.5	9.3	7
Quinto Creek	113	13.3	8.5	8
Deep Gulch	58	7.2	8.1	9
Oso Creek	83	22.5	3.7	10
Salado Creek	78	21.5	3.6	11

Table 4-4: Capacity to Dam Height Ranking

Alternative	Capacity (TAF)	Dam Height (FT)	Capacity to Dam Height Ratio	Capacity to Dam Height Rank
Little Salado Creek/Crow Creek	132	110	1.200	1
Quinto Creek	113	185	0.611	2
Romero Creek	88	205	0.429	3
Orestimba Creek	75	220	0.341	4
Del Puerto Canyon	88	260	0.338	5
Garzas Creek	86	270	0.319	6
Lone Tree Creek	63	250	0.252	7
Oso Creek	83	330	0.252	8
Ingram Canyon	67	310	0.216	9
Salado Creek	78	370	0.211	10
Deep Gulch	58	290	0.200	11

Table 4-5: Distance to DMC Ranking

Alternative	Distance to DMC (miles)	Distance to DMC Rank
Del Puerto Canyon	0.9	1
Little Salado Creek/Crow Creek	2.2	2
Ingram Canyon	3.2	3
Romero Creek	3.3	4
Lone Tree Creek	4.5	5
Salado Creek	4.6	6
Deep Gulch	4.7	7
Quinto Creek	4.8	8
Oso Creek	6.3	9
Orestimba Creek	6.8	10
Garzas Creek	6.9	11

Cumulative Ranking

The final ranking was determined using a composite rank of all three physical ratios. The lower the cumulative score, the more attractive the site. Del Puerto Canyon, with a total of 13 points, has the lowest cumulative score and was also the only site to consistently rank in the top five for each of the three physical ratios and distance criterion. **Table 4-6** shows the cumulative ranking for each of the 11 sites considered in this analysis.

Table 4-6: Cumulative Ranking of Alternatives

Alternative	Capacity to Surface Area Rank	Capacity to Dam Embank-ment Volume Rank	Capacity to Dam Height Rank	Distance to DMC Rank	Cumulative Score	Cumulative Ranking
Del Puerto Canyon	4	3	5	1	13	1
Lone Tree Creek	3	1	7	5	16	2
Little Salado Creek/Crow Creek	11	4	1	2	18	3
Ingram Canyon	1	6	9	3	19	4
Orestimba Creek	5	2	4	10	21	5
Romero Creek	9	7	3	4	23	6
Quinto Creek	10	8	2	8	28	7
Oso Creek	2	10	8	9	29	8
Garzas Creek	8	5	6	11	30	9
Salado Creek	6	11	10	6	33	10
Deep Gulch	7	9	11	7	34	11

4.7 No Project

CEQA requires the evaluation of a No Project Alternative. For the purpose of this document, the No Project Alternative has been included to satisfy the requirements of CEQA and considers expected conditions in the project area in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community service. Because of the need for water supply in the project area, and because of the constraints on groundwater pumping placed by the Sustainable Groundwater Management Act, it is assumed that under the No Project Alternative the Project Partners would have to pursue obtaining additional surface water resources to meet water demands, or portions of their service areas would need to be fallowed due to a lack of water supply. As documented *in Section 1.1.1 of Chapter 1, Introduction*, in dry years the Project Partners have historically needed to resort to land fallowing when CVP water was not available.

4.7.1 Aesthetics

The No Project Alternative would avoid aesthetic impacts associated with dam construction and would not result in any new light and glare in the project area. Although the Project Partners would pursue additional water supplies, it is expected that fallowing would increase and would incrementally degrade the visual character of the project area as irrigated lands would be replaced with dried vegetation and possibly dead orchards. Some viewers from I-5 may perceive this change as visual degradation, but because motorists views are fleeting this change in visual character is expected to be less than significant.

4.7.2 Agriculture

The No Project Alternative would not benefit existing agricultural land by providing a reliable water supply. However, there would be no direct conversion of agricultural land to water storage use and no facilities would be constructed on Williamson Act lands.

4.7.3 Air Quality

The No Project Alternative would not produce construction or operational emissions of criteria pollutants. However, the No Project Alternative would result in more fallowed land, which could increase wind generated dust and other particulates. It is not possible to quantify potential air quality impacts, which are not assumed to result in significant emissions.

4.7.4 Biological Resources - Terrestrial

The No Project Alternative would not affect terrestrial biological resources.

4.7.5 Biological Resources - Fish

The No Project Alternative would not affect native fish in Del Puerto Creek and would not have effects on deposition of spawning gravels in the San Joaquin River. .

4.7.6 Cultural Resources

The No Project Alternative would not affect cultural resources.

4.7.7 Energy Resources

The No Project Alternative would not require energy for construction, but a portion of the water that would have been pumped into the Del Puerto Canyon Reservoir as part of the proposed project would continue to be pumped into the San Luis Reservoir, so there would be ongoing energy requirements associated with the No Project Alternative.

4.7.8 Geology and Soils

No Project Alternative would not include the construction of any new facilities and thus would not have any impacts related to geology, seismicity, soils or paleontological facilities.

4.7.9 Greenhouse Gas Emissions

The No Project Alternative would not generate GHGs during construction, but some of the water that would have been pumped into the Del Puerto Canyon Reservoir as part of the proposed project would continue to be pumped into the San Luis Reservoir, so there would be some ongoing operational GHG emissions associated with the No Project Alternative.

4.7.10 Hazards and Hazardous Materials

Under the No Project Alternative there would be no impacts to existing petroleum pipeline or oil wells.

4.7.11 Hydrology

The No Project Alternative would not reduce the flood risk from Del Puerto Creek. Without additional surface water supply project benefits associated with better ability to manage groundwater resources would not be realized. This could result in potentially significant impacts on groundwater.

4.7.12 Population and Housing

The No Project Alternative would not affect population and housing.

4.7.13 Transportation and Traffic Impacts

Under the No Project Alternative there would be no construction traffic and no need to relocate Del Puerto Canyon Road.

4.7.14 Utilities

Under the No Project Alternative there would be no need to relocate existing utilities and no impact associated with that relocation.

4.8 Smaller Reservoir – 40-TAF Alternative

As part of the feasibility study for the project (AECOM 2016), a smaller reservoir size was evaluated. A reservoir configuration with a 40 thousand-acre-foot (TAF) capacity was considered. Table 4-7 summarizes the configuration of the 40-TAF Alternative as compared to the proposed project

Table 4-7: Reservoir Configuration - Proposed Project vs Smaller Reservoir

Reservoir Capacity	Embankment Volume	Embankment Height	Inundation Area
82 TAF (proposed project)	6,200,000 CY	260 feet	897 acres
40 TAF	3,500,000 CY	200 feet	617 acres

The 40-TAF alternative would have a smaller dam and smaller inundation area, which would reduce some of the project impacts. Key environmental issues are discussed below.

4.8.1 Aesthetics

The 40-TAF Alternative would reduce visual impacts because the dam would not be as large but would not avoid visual impacts associated with the dam. Even though the top of the embankment would be about 60 feet below the height of the proposed project dam, it is expected that views from I-5 would still be significantly affected.

4.8.2 Agriculture

The smaller reservoir would primarily be located in grazing land, but the dam and conveyance facilities would still affect a small amount of important farmland, similar to the proposed project. This alternative would thus have the same impacts on agriculture as the proposed project.

4.8.3 Air Quality

Because less grading would be required for this alternative, air quality emissions during construction would be less than for the proposed project. However, significant levels of NOx emissions may still result from this alternative.

4.8.4 Biological Resources - Terrestrial

Impacts to terrestrial biological resources would be reduced with the 40-TAF Alternative because the inundation area would be smaller. This would result in less potential for habitat loss including reduced impacts on oak woodlands, and habitat for sensitive amphibians, birds and mammals.

4.8.5 Biological Resources - Fish

Although the reservoir would be smaller, the impacts associated with dam operation would not change.

4.8.6 Cultural Resources

Most of the cultural resource sites are located within lower portions of the reservoir footprint. A smaller reservoir site is thus not expected to avoid impacts to cultural resources.

4.8.7 Energy Resources

Vehicle miles traveled and associated energy use for this alternative would be the same as for the proposed project. A smaller project would require less energy for construction and operation.

4.8.8 Geology and Soils

A smaller reservoir would still require similar measures to ensure dam safety and would have geotechnical constraints similar to the proposed project.

4.8.9 Greenhouse Gas Emissions

Similar to air quality impacts, the construction and operational GHG emissions would be less for a smaller project. However, both construction and operational emissions would remain significant.

4.8.10 Hazards and Hazardous Materials

Because the inundation area would be smaller, the 40-TAF Alternative would avoid abandoned oil wells that are very close to or within the inundation area for the proposed project. This alternative would still require relocation of a petroleum pipeline.

4.8.11 Hydrology

A smaller reservoir would have impacts similar to the proposed project.

4.8.12 Population and Housing

Similar to the proposed project a smaller reservoir would have no population and housing impacts because there are no residences located within the reservoir inundation area. Neither the proposed project nor the 40-TAF Alternative would be growth inducing.

4.8.13 Transportation and Traffic Impacts

Construction impacts would be slightly less, because this alternative would construct a smaller dam, but impacts on the I-5 interchange would still be significant. Del Puerto Canyon Road would still have to be relocated, so vehicle miles traveled impacts would be the same as for the proposed project.

4.8.14 Utilities

Because the reservoir location would be similar, this alternative would have similar utility relocation impacts as the proposed project. Although the reservoir would be smaller it would still inundate the existing utility corridor.

4.9 Ingram Canyon Reservoir Site

Although the Ingram Canyon site was eliminated from consideration during project screening, potential impacts of this alternative are considered here because several commenters requested consideration of the Ingram Canyon site. **Table 4-8** summarizes the configuration of the Ingram Canyon Alternative as compared to the proposed project. The location of the dam is identified in previous documents as being about two miles west of Interstate 5 (Department of Water Resources 1996). Detailed design information is not available, but the Ingram Canyon Alternative would require construction of a larger embankment and a longer conveyance corridor. This alternative would not require relocation of a public road, because Ingram Creek Road is a private road serving one local ranching operation, which would be inundated by the reservoir. However, it is assumed that the existing private road would need to be improved or replaced to provide access to the dam and reservoir. The extent of construction is thus expected to be similar or greater than that required for construction of the proposed project. Analysis of impacts associated with the Ingram Canyon Reservoir site assumes implementation of the same or similar mitigation measures as would be applicable to the proposed project, including measures to protect biological, cultural and paleontological resources and to address construction period impacts on air quality and traffic.

Table 4-8: Reservoir Configuration - Proposed Project vs Ingram Canyon

Reservoir Site	Capacity (TAF)	Embankment Volume	Embankment Height	Inundation Area	Length of Conveyance Corridor
Del Puerto Canyon (proposed project)	82	6,200,000 CY	260 feet	897 acres	0.9 miles
Ingram Canyon	67	7,200,000 CY	310 feet	633 acres	3.2 miles

4.9.1 Aesthetics

The Ingram Canyon Alternative would not completely avoid visual impacts associated with construction of a dam, but the site is farther from I-5 and would be expected to be less visible from the scenic highway.

4.9.2 Agriculture

The Ingram Canyon dam and reservoir are located entirely on grazing land, but the conveyance facilities leading from the DMC to the reservoir would cross prime farmland. Similar to the proposed project, pipeline construction impacts would be temporary because agricultural activities within the pipeline easement could resume after construction, however it is likely that the pump station would permanently affect a small amount of important farmland. The reservoir and conveyance facilities would also be located within land under Williamson Act Contracts. This alternative would thus have the impacts on agriculture similar to or greater than the proposed project.

4.9.3 Air Quality

This alternative is still expected to result in substantial air quality emissions during construction. Because of the extensive amount of construction required, emissions are expected to be greater than those associated with construction of the proposed project. This alternative would generate significant NOx emissions, and it is uncertain whether emissions would be fully mitigable. Construction emissions are considered potentially significant. With higher construction emissions the overall air quality impacts are estimated to be greater than the impacts of the proposed project.

4.9.4 Biological Resources - Terrestrial

Because the inundation area would be smaller than with the proposed project, it could be assumed that there would be less potential for habitat loss including reduced impacts on oak woodlands, and habitat for sensitive amphibians, birds and mammals, however a previous study (DWR 1996) ranked Ingram Canyon as having an environmental sensitivity similar to Del Puerto Canyon.

4.9.5 Biological Resources - Fish

Because the impacts associated with dam operation would be similar, this alternative would have similar impacts as compared to the proposed project.

4.9.6 Cultural Resources

Cultural resource sensitivity of Ingram Canyon is unknown, but it is assumed that there would be similar potential to encounter prehistoric sites that could be adversely affected by construction of a dam and reservoir.

4.9.7 Energy Resources

The Ingram Canyon Alternative is expected to require similar or greater amounts of energy for construction and more energy for operation. The Ingram Canyon alternative would require a longer conveyance structure and pumping to a greater elevation than with the proposed project, which is estimated to double the energy requirements for operation.

4.9.8 Geology and Soils

Geotechnical constraints associated with construction of the Ingram Canyon alternative are expected to be similar to those for the proposed project.

4.9.9 Greenhouse Gas Emissions

Similar to air quality impacts, construction GHG emissions are expected to be greater than those for the proposed project. Operational GHG impacts would be significant and are expected to be double that of the proposed project because of the energy required to pump water through a longer pipeline to a dam located at a higher elevation.

4.9.10 Hazards and Hazardous Materials

The Ingram Canyon site does not contain any abandoned well sites (DOGGR 2019). Because the dam would not be constructed in the area crossed by the petroleum pipeline that parallels Interstate 5, the pipeline would not need to be relocated, though the conveyance pipeline would need to cross the petroleum pipeline.

4.9.11 Hydrology

Hydrology impacts would be similar to the proposed project.

4.9.12 Population and Housing

Because there are no residences located within the project area for the Del Puerto Canyon Reservoir, the proposed project does not have population and housing impacts. A reservoir in Ingram Canyon would not displace substantial numbers of existing residences, but there is a ranching operation and rural residence in the canyon that would be displaced by construction of the reservoir. Because the Project Partners are seeking to avoid displacement of any existing homes or businesses, this would be considered a significant impact of the Ingram Canyon Alternative.

4.9.13 Transportation and Traffic Impacts

This alternative would avoid significant construction impacts at the ~~Del Puerto Canyon Road~~ Sperry Avenue/Diablo Grande Parkway /I-5 interchange. However, there would be a potential for significant construction traffic impacts at the Howard Road/I-5 interchange. Although this interchange is not expected to experience the same level of evening peak commute traffic as the ~~Del Puerto Canyon Road~~ Sperry Avenue/Diablo Grande Parkway/I-5 interchange, it does accommodate existing high volumes of traffic from trucks using truck stop facilities at Joe's Travel Plaza and the Triangle Truck Stop. Because relocation of a public road is not needed, increases in VMT associated with relocating Del Puerto Canyon Road would be avoided. A construction traffic management plan would still be implemented to address potential conflicts with users of the roadway network in the project area, but it is uncertain whether impacts of construction traffic would be mitigable or significant and unavoidable.

4.9.14 Utilities

The Ingram Canyon alternative site is located west of the existing high voltage transmission lines and petroleum pipeline that cross the site of the proposed reservoir. This alternative would thus avoid the utility relocation impacts that would be associated with the proposed project.

4.10 Alternative Comparison

Table 4-11 at the end of this chapter provides a summary comparison of alternatives. Impacts for each alternative are identified based on the level of significance after implementation of mitigation measures and impacts relative to the proposed project are identified.

4.10.1 Ability to Meet Project Objectives

As noted above, CEQA Guidelines Section 15126.6 requires EIRs to evaluate a range of reasonable alternatives to a project, or to the location of a project that would feasibly attain most of the basic project objectives. The Project objectives are identified in Chapter 1, and **Table 4-9** evaluates the extent to which each alternative, including the No Project Alternative, achieves those objectives. All of the action alternatives improve water supply reliability and groundwater management and increase peak season supply and provide economic benefits. The Ingram Canyon Alternative would meet several project objectives but does not meet the criteria for size and proximity and is not considered cost effective, because a large embankment would need to be constructed for smaller capacity reservoir and the distance from the DMC would require a more expensive conveyance facility. The No Project Alternative would meet none of those objectives.

Table 4-9: Ability to Meet Project Objectives

Alternative	80 TAF capacity	Proximity to DMC and users	Improve Reliability	Increase peak season supply	Improve surface water and groundwater management	Self-reliance and economic benefit	Cost effective	Avoid home/ business displacement
Proposed project	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40 TAF Reservoir	No	Yes	Yes	Yes	Yes	Yes	No	Yes
Ingram Canyon	No	No	Yes	Yes	Yes	Yes	No	No
No Project	No	NA	No	No	No	No	NA	Yes

4.11 Environmentally Superior Alternative

CEQA requires that an EIR identify the environmentally superior alternative of a project other than the No-Project Alternative (CEQA Guidelines, Section 15126.6 (e)(2)). In identifying the environmentally superior alternative, the extent of environmental impacts was considered in conjunction with the environmental benefits provided by the project. Per CEQA, the costs associated with the project is not considered in the context of identifying the environmentally superior alternative; rather, it is the responsibility of the Lead Agency to select the appropriate alternatives and issue, if required, a statement identifying the overriding considerations that led to that decision. **Table 4-10** compares the impacts of each alternative in relation to the significant unavoidable impacts associated with the proposed project or project alternatives.

Table 4-10: Comparison of Significant Impacts by Alternative

Impact Statement	Proposed Project	40-TAF Reservoir	Ingram Canyon Reservoir Site
3.1 Aesthetics			
AES-1: Substantial damage to scenic resources within a state scenic highway and substantial degradation of existing visual character or quality, or a substantial adverse effect on a scenic vista.	SU	SU =	SU <
3.3 Air Quality			
AIR-2: Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or state ambient air quality standard.	LSM	LSM <	PS or SU >
3.6 Cultural Resources			
CULT-2: Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to §15064.5.	SU	SU =	SU =
3.9 Greenhouse Gas Emissions			
GHG-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	SU	SU <	SU >
GHG-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases	SU	SU <	SU >
3.13 Traffic and Transportation			
TR-1: Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.	SU	SU <	PS or SU ≤
3.15 Utilities and Service Systems			
UTL-1: 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.	SU	SU =	LTS <

Key: NI= no impact; LTS=less than significant; LSM=less than significant with mitigation; PS = potentially significant; SU=significant and unavoidable;
> impacts greater than proposed project; = impacts same as proposed project; < impacts less than proposed project; ≤ impacts less than or same as proposed project

As stated at the beginning of this chapter, the purpose of this alternatives analysis is to consider a reasonable range of alternatives that could feasibly attain most of the basic Project objectives and avoid or substantially lessen significant Project impacts. Implementation of the No Project Alternative would not result in any adverse environmental impacts associated with construction, but it also would not meet any of the Project objectives nor provide any of the environmental benefits associated with increased reliability of water supply and ability to better manage groundwater resources. Without the water storage provided by the Project, it is expected that lack of water supply would result in fallowing in the Project Partners' service area; lack of water supply could also result in changes in visual character associated with loss of trees in orchards, as well as degradation of air quality due to blowing dust from fallowed fields. The No Project Alternative is thus not considered to be environmentally superior.

All of the alternatives are considered to have significant unavoidable impacts to cultural resources and would result in significant operational emissions of GHGs. It is not possible to construct a large reservoir without significantly changing the visual character of an area, and all of the project alternatives are also considered to have significant unavoidable visual impacts.

The Ingram Canyon Alternative would not require relocation of utilities and would thus avoid impacts of raising or moving powerlines and relocating a petroleum pipeline. The dam and reservoir would be far enough from Interstate 5 and population centers that visual impacts would be less. The Ingram Canyon site would avoid construction traffic impacts affecting the Interstate 5/Sperry Avenue/Diablo Grande Parkway interchange but would result in impacts at the Interstate 5/Howard Road interchange. Overall construction impacts including construction air and GHG emissions are expected to be greater than those associated with the proposed project because of the more extensive construction required to build a larger embankment, longer conveyance, and new access road. The greatest substantive change in impacts is associated with the substantially higher energy requirement to operate the Ingram Canyon Alternative; energy use and associated GHG emissions are expected to double. This would conflict with statewide energy objectives and GHG reduction goals. Thus, while this alternative reduces some impacts as compared to the project, the long-term GHG emissions associated with operation would outweigh the reductions in construction impacts and reduction in potential visual impacts.

None of the action alternatives is thus considered to be clearly environmentally superior to the proposed project.

4.12 References

AECOM 2016. Del Puerto Canyon Reservoir Phase 1 Feasibility Assessment, March 9, 2016

Department of Water Resources. 1996. Alternative South-of-the-Delta Offstream Reservoir Reconnaissance Study, Phase One

DOGGR. 2019. Well Finder. Available at : https://maps.conservation.ca.gov/doggr/wellfinder/#openModal/-121.29585/37.52137/14; accessed September 23, 2019

Table 4-11: Impact Comparison of Alternatives to the Proposed Project (Impacts after Mitigation)

Impact Statement	Proposed Project	40-TAF Reservoir	Ingram Canyon Reservoir Site	No Project Alternative
3.1 Aesthetics				
AES-1: Substantial damage to scenic resources within a state scenic highway and substantial degradation of existing visual character or quality, or a substantial adverse effect on a scenic vista.	SU	SU=	SU <	LTS
AES-2: Potential to create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.	LSM	LSM=	LSM <	NI
3.2 Agriculture and Forestry Resources				
AG-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), to Non-Agricultural Use.	LTS	LTS =	LTS =	NI
AG-2: Conflict with Existing Zoning for Agricultural Use, or a Williamson Act Contract.	LTS	LTS =	LTS =	NI
3.3 Air Quality				
AIR-1: Conflict with or obstruct implementation of the applicable air quality plan.	LTS	LTS <	LTS =	NI
AIR-2: Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or state ambient air quality standard.	LSM	LSM <	PS or SU >	LTS
AIR-3: Expose sensitive receptors to substantial pollutant concentrations.	LSM	LSM <	LSM =	NI
AIR-4: Result in other emissions (such odors or dust adversely affecting a substantial number of people).	LTS	LTS	LTS	NI
3.4 Biological Resources – Terrestrial				
BIO-TERR-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	LSM	LSM <	LSM <	NI
BIO-TERR-2: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	LSM	LSM <	LSM <	NI
BIO-TERR-3: Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	LSM	LSM <	LSM <	NI
BIO-TERR-4: 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.	LSM	LSM <	LSM <	NI

Impact Statement	Proposed Project	40-TAF Reservoir	Ingram Canyon Reservoir Site	No Project Alternative
BIO-TERR-5: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	LSM	LSM <	LSM<	NI
BIO-TERR-6: Conflict with Adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.	NI	NI =	NI =	NI
BIO-TERR-7: Spread invasive plant species such that there would be a substantial effect on special-status species, sensitive communities, or wetlands.	LTS	LTS =	LTS =	NI
3.5 Biological Resources - Fisheries				
BIO-FISH-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	LSM	LSM =	LSM =	NI
BIO-FISH-2: 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.	LTS	LTS =	LTS =	NI
3.6 Cultural Resources				
CULT-1: Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5.	LTS	LTS =	LTS =	
CULT-2: Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to §15064.5.	SU	SU =	SU =	NI
CULT-3: Disturb any human remains, including those interred outside of dedicated cemeteries.	LSM	LSM =	LSM =	NI
3.7 Energy Resources				
ENE-1: Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.	LSM	LSM <	LSM >	NI
ENE-2: Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	LTS	LTS <	LTS >	NI
3.8 Geology and Soils				
GEO-1: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault ii) Strong seismic ground shaking	LSM	LSM =	LSM =	NI

Impact Statement	Proposed Project	40-TAF Reservoir	Ingram Canyon Reservoir Site	No Project Alternative
iii) Seismic-related ground failure, including liquefaction iv) Landslides.				
GEO-2: Result in substantial soil erosion or the loss of topsoil.	LSM	LSM =	LSM =	NI
GEO-3: 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.	LSM	LSM =	LSM =	NI
GEO-4: 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.	LSM	LSM =	LSM =	NI
GEO-5: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	LSM	LSM =	LSM =	NI
3.9 Greenhouse Gas Emissions				
GHG-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	SU	SU <	SU >	NI
GHG-2: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	LSM	LSM <	LSM =	NI
3.10 Hazards and Hazardous Materials				
HAZ-1: 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.	LSM	LSM <	LSM <	NI
3.11 Hydrology and Water Quality (preliminary assessment based on incomplete section)				
HYD-1: Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.	LSM	LSM	LSM	NI
HYD-2: Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.	LSM	LSM	LSM	PS
HYD-3: In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation.	LTS	LTS	LTS	NI
HYD-4: Conflict with Coordinated Operations Agreement and Existing CVP Operations	LTS	LTS	LTS	NI
3.12 Land Use and Recreation				
LU-1: Conflict with Any Applicable Land Use Plan, Policy, or Regulation.	LSM	LSM =	LTS <	NI
Population and Housing				
Displace existing people or housing	NI	NI =	LTS >	NI
3.13 Traffic and Transportation				

Impact Statement	Proposed Project	40-TAF Reservoir	Ingram Canyon Reservoir Site	No Project Alternative
TR-1: Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.	SU	SU <	LSM <	NI
TR-2: Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).	LTS	LTS =	LTS <	NI
TR-3: Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	LSM	LSM =	LSM <	NI
TR-4: Result in inadequate emergency access.	LSM	LSM =	LSM <	NI
3.14 Tribal Cultural Resources				
TRIB-1: Project would cause a substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in the California Register of Historical Resources or other local register.	NI	NI =	NI =	NI
TRIB-2: Project would cause a substantial adverse change in the significance of a tribal cultural resource that is determined by the lead agency to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria, the lead agency shall consider the significance of the resource to a California Native American tribe.	NI	NI =	NI =	NI
3.15 Utilities and Service Systems				
UTL-1: 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.	SU	SU =	LTS <	NI

Chapter 5 Other CEQA Considerations

5.1 Significant and Unavoidable Impacts

If the Project Partners decide to move forward with implementation of the proposed project, both the Del Puerto Water District and Exchange Contractors would be required to adopt Findings and prepare a Statement of Overriding Considerations for the project's unavoidable adverse impacts as part of the approval of the project. The following impacts were determined to be significant and unavoidable:

Impact AES-1: Substantial damage to Scenic Resources within a State Scenic Highway, and Substantial Degradation of Existing Visual Character or Quality, or a Substantial Adverse Effect on a Scenic Vista. The proposed dam would be highly visible and would have unavoidable adverse impacts on views from Interstate-5, which is a scenic highway, and would alter the visual character of the area. Mitigation would be implemented to screen the pumping plant but there is no feasible mitigation that would reduce the visual impacts of the dam to less than significant.

Impact CULT-2: Substantial Adverse Change in Significance of a Unique Archaeological Resource. The project area potentially has a high level of sensitivity for cultural resources. There are previously recorded archaeological sites within the reservoir site and there is a reasonable likelihood that there could be previously undiscovered resources within the reservoir inundation that cannot be avoided.

Impact GHG-1: Generate Greenhouse Gas emissions, Either Directly or Indirectly, That May Have a Significant Impact on the Environment and GHG-2: Conflict with Greenhouse Gas Reduction Plan. Both construction and operation of the project would generate substantial GHG emissions.

Impact TR-1: Conflict with a Plan, Ordinance or Policy Addressing the Circulation System, Including Transit, Roadway, Bicycle and Pedestrian Facilities: Project construction traffic would increase unacceptable delays during the evening peak hour at the southbound Interstate 5/Sperry Avenue/Diablo Grande Parkway Interchange.

Impact UTL-1: Require Relocation of Electric Power, Natural Gas, and Telecommunication Facilities, the Construction or Relocation of Which May Cause Significant Environmental Effects. Relocation of high-voltage power lines and a petroleum pipeline would be required for project implementation. Impacts of these major utility relocations would contribute to the significant impacts identified above.

5.2 Irreversible and Irretrievable Commitments of Resources

Implementation of the proposed project would require irreversible commitment of natural resources including land; construction materials; labor; and energy required for construction, operation, and maintenance. Commitment of non-renewable natural resources used in construction would include gravel, petroleum products, steel, and others. Commitment of energy resources for construction would include fuel oil, natural gas, and gasoline for heavy machinery. The project would permanently convert existing agricultural land for use as a water storage facility. Operation of the proposed project would result in further commitment of energy resources. However, the consumption of energy for construction and operation would not be inefficient, wasteful or unnecessary. The proposed project would increase the reliability of water supply for irrigation of agricultural lands of significant importance within the region.

5.3 Growth Inducing Impacts

The California Environmental Quality Act (CEQA) requires the Lead Agency to evaluate whether a proposed Program will directly or indirectly induce growth of population, economic development, or housing construction. Specifically, CEQA Guidelines Section 15126.2(d) states the need to evaluate the potential for a proposed Program to "foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas)."

Directly induced growth is associated with residential or commercial development projects that would result in a population increase or in an increase in the number of employees. Indirectly induced growth is associated with reducing or removing barriers to growth or creating a condition that encourages additional population or economic activity. Ultimately, both types of growth induction result in population increase, which "may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects" (CEQA Guidelines Section 15126.2[d]). Other potential environmental impacts related to growth include increased traffic, air emissions, and noise; degradation of water quality; loss of sensitive biological and cultural resources; increased demand on public services and infrastructure; and changes in land use and conversion of agricultural or open space to accommodate development.

Under CEQA, growth inducement is neither considered necessarily detrimental, beneficial, nor of little significance to the environment.

Projects are considered to have growth-inducing implications when economic, housing, or population growth occur either directly or indirectly. Local land use plans (e.g., general plans) provide for development patterns and growth policies that allow for the planned and orderly expansion of urban development (i.e., residential, commercial and industrial uses) supported by adequate urban public services (e.g., water supply, wastewater treatment, solid waste service disposal capacity, police and fire services). A project that would induce unplanned growth (i.e., conflict with local land use plans) could indirectly cause adverse environmental impacts not previously envisioned. Thus, to assess whether a project has the potential to induce growth and result in adverse secondary effects beyond what is anticipated by the local jurisdiction, it is important to assess the degree to which the growth associated with a project would or would not be consistent with the applicable land use plan.

Construction of the proposed project would not directly induce population growth, as no new residential or commercial development projects would be served by the project. As stated in the Initial Study for the Proposed Project, the project does not include construction of any new homes or businesses in the project area, and therefore would not directly induce growth. The Project Partners provide irrigation water to existing agricultural users and would not indirectly accommodate additional development in Stanislaus or surrounding Counties.

The proposed project would provide approximately 82,000 acre-feet (AF) of additional off-stream storage South of the Sacramento-San Joaquin Delta. The purpose of the project is to develop a feasible amount of South of Delta water storage, allowing project partners to maximize the management and efficient use of existing water supplies. Water would be conveyed from the Delta-Mendota Canal (DMC) to be stored in the proposed reservoir. The water stored would serve existing agricultural users in both Del Puerto Water District (DPWD) and the Exchange Contractor's service areas, and potentially other South of Delta purposes, including supply for wildlife refuges designated under the Central Valley Project Improvement Act. Additionally, the project would not indirectly generate any new agriculture production in the area.

The construction labor force is expected to come from the local area and is not expected to increase population in Stanislaus County. While additional employees would be needed to operate the proposed project, the estimated five additional employees in the area would have minimal effect on planned growth in the project area and Stanislaus County.

The proposed project would also not indirectly induce growth (by removing or reducing the barriers to growth) because water will only be stored to increase efficiency of use of available resources rather than adding additional potable supply to serve population growth. The water stored would be used beneficially for irrigation by existing growers and would assist the Project Partners to maximize available water supplies. Proposed project water could also supplement supplies to wildlife refuges for environmental benefit. Delivering water supply to wildlife refuges and to agriculture users within the Project Partners' service areas would not increase existing potable water supplies, and thus would not indirectly accommodate additional development within the cities or counties. Therefore, the proposed project would not induce growth and no growth-inducing impact would be expected.

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Chapter 6 Consultation, Coordination and Compliance

This chapter summarizes public and agency involvement activities undertaken for the proposed project by the Del Puerto Canyon Reservoir (DPCR) Partner Agencies. As noted previously the Del Puerto Water District (DPWD) is the California Environmental Quality Act (CEQA) lead agency.

The DPCR Project proposed to be constructed and operated in a collaborative partnership between DPWD and the San Joaquin River Exchange Contractors Water Authority, the Project Partners. The Project Partners have engaged with local landowners and organizations on an ongoing basis and have consulted with key state and federal agencies regarding the feasibility of the DPCR, and to identify environmental issues associated with project implementation. The DPCR Project Partners will continue to solicit public and agency input on the project by encouraging review of this EIR.

6.1 Scoping

The CEQA Notice of Preparation (NOP) was released on June 27, 2019 and distributed to 29 agencies. Postcards with information on where the NOP could be viewed and notification of the scoping meeting were also sent to 35 additional agencies, organizations and property owners. The release of the NOP, along with postings of these notices in the local newspapers and on the website for the Del Puerto Canyon Reservoir Project, began the 30-day public review period, which ended on July 29, 2019. A public scoping meeting for the EIR was held at on July 24, 2019 in the City of Patterson (Patterson Fire Station #2, 1950 Keystone Pacific Parkway). The Scoping Report is included in **Appendix A.**

6.2 EIR Distribution

Upon completion of the Draft EIR, DPWD filed a Notice of Completion (NOC) with the State Office of Planning and Research to begin a 45-day public review period, which is the review period required by CEQA (Public Resources Code, Section 21161). Concurrent with issuance of the NOC, the Draft EIR was distributed to responsible and trustee agencies, other affected agencies, surrounding cities, and interested parties, as well as all parties requesting a copy of the EIR in accordance with Public Resources Code 21092(b)(3). During the public review period, the Draft EIR is available for review at the Partner Agencies' main offices, or online at the following locations and links:

Del Puerto Water District	Exchange Contractors	Patterson Public Library
17840 Ward Avenue	541 H Street	46 N Salado Avenue
Patterson, CA 95363	Los Banos, CA 93635	Patterson, CA 95363

Project website: https://www.delpuertocanyonreservoir.com/

Agencies, organizations, and interested parties, including those not previously contacted, or who did not respond to the NOP, had the opportunity to comment on the Draft EIR during the public review period.

6.3 Public Involvement

In accordance with CEQA public review requirements, the Draft EIR has been circulated for public and agency review and comment for a 45-day review period, starting December 12, 2019. During the public review period a meeting was held on January 15, 2019 from 4-6 pm at Hammon Senior Center, 1033 W. Las Palmas Avenue, Patterson, CA, to receive comments on the Draft EIR. Comments submitted at that meeting, along with any written comments received by DPWD, are addressed in the Final EIR, which has been prepared and circulated in accordance with CEQA requirements. DPWD will hold a public hearing to consider certification of the EIR.

The Project Partners will use the Final EIR when considering approval of the proposed project. If the proposed project or another alternative is approved, the Project Partners will make CEQA findings and issue a Notice of Determination.

6.4 Compliance with Federal Statutes and Regulations

This section describes the status of compliance with relevant federal laws, executive orders, and policies. This EIR has been prepared to meet requirements of the California Environmental Quality Act, but has also been structured to allow but is also structured to enable future NEPA documentation subject to the Council on Environmental Quality (CEQ) Regulations for Implementing the National Environmental Policy Act (Parts 1500 to 1508) so that the Project Partners can pursue federal funding from the Bureau of Reclamation.

6.4.1 Federal Endangered Species Act

Section 7 of the Federal Endangered Species Act (FESA) (16 U.S.C. § 1531 *et seq.*) requires federal agencies, in consultation with and with the assistance of the Secretary of the Interior and or Commerce, to ensure that their actions do not jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of these species. Under section 7, if a project could result in incidental take of a listed threatened or endangered species, federal agencies must consult with the United States Fish and Wildlife Service (USFWS) and/or the NOAA's National Marine Fisheries Service (NMFS) to obtain a Biological Opinion. If the federal agency finds that the project is not likely to adversely affect federally threatened or endangered species, the federal agency can consult informally, and if USFWS and NMFS agree with that finding, a concurrence letter can be issued.

Chapters 3.4, Biological Resources-Terrestrial and *3.5, Biological Resources-Fish*, describe the sensitive species that have the potential to occur in the area, and potential effects to federal endangered and threatened species. Impacts to species will be avoided through the implementation of Mitigation Measures, or through measures established in the Biological Opinion or concurrence letter. This EIR is structured to provide information to support section 7 consultation with USFWS and, if necessary, with NMFS. Reclamation will not initiate any action that would affect a federally listed species without first completing the appropriate consultation(s) with USFWS or NMFS and receiving formal notice that the action would not jeopardize the continued existence of the listed species or adversely modify designated critical habitat.

6.4.2 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) of 1934, as amended (16 U.S.C. § 661 *et seq*.) is intended to promote conservation of fish and wildlife resources by preventing their loss or damage, and to provide for development and improvement of fish and wildlife resources in connection with water projects. Federal agencies undertaking water projects are required to fully consider recommendations made by USFWS, NMFS, and State wildlife agencies when any waterbody is impounded, diverted, controlled, or modified for any purpose.

Based on surveys and investigations to be conducted by the federal and state agencies charged with administering wildlife resources, a report addressing any potential impacts to fish and wildlife species and appropriate mitigation measures would be provided to Reclamation for the Proposed Project. Compliance with FWCA will be coordinated with Endangered Species Act consultation, as described above.

6.4.3 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) of 1976 as amended (16 U.S.C. § 1801 *et seq*.), is the primary act governing federal management of fisheries in federal waters, from the 3-nautical-mile state territorial sea limit to the outer limit of the U.S. Exclusive Economic Zone. It establishes exclusive U.S. management authority over all fishing within the Exclusive

Economic Zone, all anadromous fish throughout their migratory range except when in a foreign nation's waters, and all fish on the continental shelf. The Magnuson-Stevens Act establishes eight Regional Fishery Management Councils responsible for the preparation of fishery management plans to achieve the optimum yield from U.S. fisheries in their regions. The act also requires federal agencies to consult with NMFS on actions that could damage Essential Fish Habitat (EFH), as defined in the 1996 Sustainable Fisheries Act (Public Law 104-297). EFH includes those habitats that support the different life stages of each managed species. A single species may use many different habitats throughout its life to support breeding, spawning, nursery, feeding, and protection functions. EFH can consist of both the water column and the underlying surface (e.g., streambed) of a particular area. The San Joaquin River in the Study Area is designated EFH for Chinook salmon. As described in *Section 3.5, Biological Resources-Fish*, the project is not expected to have adverse effect on fish habitat in the San Joaquin River.

6.4.4 National Historic Preservation Act, Section 106

The purpose of the National Historic Preservation Act (NHPA) (16 U.S. Code § 470) is to protect, preserve, rehabilitate, or restore significant historical, archeological, and cultural resources. Section 106 of the act requires Federal agencies to take into account effects on historic properties. Once an undertaking has been established, the Section 106 review involves a step-by-step procedure described in detail in the implementing regulations (36 CFR Part 800). As described in *Section 3.6, Cultural Resources*, a historic property survey report for the proposed project was prepared. This analysis includes a Section 106 evaluation for the proposed project. Completion of the cultural resources report and concurrence by SHPO would ensure compliance with the NHPA.

6.4.5 Clean Air Act

The U.S. Congress adopted general conformity requirements as part of the Clean Air Act (CAA) Amendments in 1990 and the USEPA implemented those requirements in 1993 (Sec. 176 of the CAA (42 U.S.C. § 7506) and 40 CFR Part 93, Subpart B). General conformity requires that all federal actions "conform" with the State Implementation Plan (SIP) as approved or promulgated by USEPA. The purpose of the general conformity program is to ensure that actions taken by the federal government do not undermine state or local efforts to achieve and maintain the national ambient air quality standards. Before a federal action is taken, it must be evaluated for conformity with the SIP. All "reasonably foreseeable" emissions predicted to result from the action are taken into consideration. These include direct and indirect emissions and must be identified as to location and quantity. If it is found that the action would create emissions above de minimis threshold levels specified in USEPA regulations (40 CFR § 93.153(b)), or if the activity is considered "regionally significant" because its emissions exceed 10 percent of an area's total emissions, the action cannot proceed unless mitigation measures are specified that would bring the proposed Project/Action into conformance. As described in *Section 3.3, Air Quality*, the study area lies within the San Joaquin Valley Air Basin. With implementation of Mitigation Measure AIR-1 (reduce NOx emissions), impacts would be reduced to less than significant. Evaluation of Air Quality Conformity will be done as part of the NEPA process. Thus, the project would be in compliance with this Act.

6.4.6 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) (16 U.S.C. § 1451 *et seq.*), passed by Congress in 1972 and managed by the National Oceanic and Atmospheric Administration's (NOAA) Office of Ocean and Coastal Resource Management, is designed to balance completing land and water issues in coastal zones. It also aims to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone." Within California, the CZMA is administered by the Bay Conservation and Development Commission, the California Coastal Conservancy, and the California Coastal Commission. No portion of the proposed project is within the coastal zone, as the study area is located approximately 50 miles east of the coast. Therefore, the Coastal Zone Management Act does not apply to the proposed project.

6.4.7 Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) (7 U.S.C. § 4201 *et seq.*) requires a federal agency to consider the effects of its actions and programs on the nation's farmlands. The FPPA is intended to minimize the impact of federal programs with respect to the conversion of farmland to nonagricultural uses. It assures that, to the extent possible, federal programs are administered to be compatible with state, local, and private programs and policies to protect farmland. As described in *Section 3.2, Agriculture and Forestry Resources*, 2 acres of long term conversion of important farmland to non-agricultural use within the dam and reservoir footprint may occur, but this area is no longer irrigated so may not qualify as important farmland by the time project construction would begin. If necessary, the lead agency coordinate with the Natural Resource Conservation Service regarding potential loss of farmland**.** Thus, the project would be in compliance with this Act.

6.4.8 Executive Order 11988 – Floodplain Management

Executive Order (EO) 11988 requires federal agencies to recognize the values of floodplains and to consider the public benefits from restoring and preserving floodplains. The project is outside the floodplain of the San Joaquin River and its tributaries. Because there would be no facilities located within the floodplain the project would not increase flood hazards or interfere with floodplain management. The Project Partners have considered Executive Order 11988 in their development of this EIR and have complied with this order.

6.4.9 Federal Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and Executive Order 13168

The Migratory Bird Treaty Act (16 U.S.C. §§ 703-712) and the Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668c) prohibit the take of migratory birds (or any part, nest, or eggs of any such bird) and the take and commerce of eagles. EO 13168 requires that any project with federal involvement address impacts of federal actions on migratory birds. As described in *Section 3.4, Biological Resources-Terrestrial*, the proposed project could have potential to impact nesting birds. Although there are no identified nests in the vicinity of the project area a golden eagle was observed in flight over the project area. However, with mitigation measure BIO-TERR-1k, impacts to nesting birds, including eagles would be reduced to less than significant. There is no bald eagle habitat in the project area so impacts to bald eagle are not expected. Thus, the lead agency would be in compliance with this EO.

6.4.10 Executive Order 13112: Invasive Species

EO 13112 directs all federal agencies to prevent and control introductions of invasive non-native species in a cost-effective and environmentally sound manner to minimize their economic, ecological, and human health impacts. As directed by this EO, a national invasive species management plan guides federal actions to prevent, control, and minimize invasive species and their impacts (NISC 2008). To support implementation of this plan, the U.S. Army Corps of Engineers (USACE) has recently released a memorandum describing the U.S. Army Corps of Engineers Invasive Species Policy (USACE 2009). This policy includes addressing invasive species effects in impact analysis for civil works projects. There are invasive species in the study area. Reclamation, as the federal NEPA lead, for the proposed project will comply with this executive order through its preparation of a NEPA document and through the regulatory permitting process. Measures to control spread of invasive species during construction will be implemented. In areas where revegetation is required, use of native species will be required so as to insure that invasive non-native plant species are not introduced to the area. Conveyance of water to and from the DMC would not entail any risk of introducing invasive aquatic species to the DMC. The project would thus be in compliance with this EO.

6.4.11 Executive Order 11990 – Protection of Wetlands

Under EO 11990, federal agencies must avoid affecting wetlands unless it is determined that no practicable alternative is available. The EO directs federal agencies to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in implementing civil works. As described in *Section 3.4, Biological Resources*, wetlands occur in the study area. A jurisdictional wetland delineation will be conducted to evaluate wetland features that would be affected by the project. The delineation will be submitted to USACE for verification. Mitigation measures have been identified to reduce potentially significant impacts to less than significant levels. These include avoidance of federally protected wetlands to the extent possible through alignment adjustments and compensatory mitigation for losses of aquatic resources. Thus, the lead agency would be in compliance with EO 11990.

6.4.12 Wild and Scenic Rivers Act

The Wild and Scenic Rivers Act (6 U.S.C. § 1271 *et seq.*) was passed in 1968 to preserve and protect designated rivers for their natural, cultural, and recreational value. There are no designated Wild and Scenic Rivers within the study area, nor will any designated rivers be adversely affected by the proposed project. As such, the Wild and Scenic Rivers Act does not apply to the proposed Project/Action.

6.4.13 Safe Drinking Water Act - Source Water Protection

Section 1424(e) of the Safe Drinking Water Act (42 U.S.C. § 300f *et seq.*) established the USEPA's Sole Source Aquifer Program. This program protects communities that have no alternative source of water from groundwater contamination from federally-funded projects. Within USEPA's Region 9, which includes California, there are nine sole source aquifers. None of these sole source aquifers are located within the proposed project study area (USEPA 2019), therefore the Sole Source Aquifer Program does not apply to the proposed project, and the lead agency is in compliance with Section 1424(e) of the Safe Drinking Water Act.

6.4.14 Executive Order 13195 - Trails for America in the 21st Century

The EO on Trails for America requires federal agencies to protect, connect, promote, and assist trails of all types throughout the United States. The proposed project would not result in any impacts on trails. There is a large network of off-road vehicle trails in Frank Raines County Park, but the park is about 9 miles west of the project area and none of those trails would be affected by the project. Thus, no adverse effects on trails would occur and the lead agency is in compliance with this EO.

6.4.15 Executive Order 13007 - Indian Sacred Sites

Sacred sites are defined in EO 13007 (May 24, 1996) as "any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site." The proposed project would not be located on or impact any Federal lands and therefore would not affect any Indian sacred sites.

6.5 References

United States Environmental Protection Agency (USEPA). 2019. Pacific Southwest, Region 9. Ground Water – Sole Source Aquifer. Accessed July 23, 2019. Available at: https://archive.epa.gov/region9/water/archive/web/html/ssa.html

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Chapter 7 EIR Preparers

A list of persons who prepared or reviewed various sections of the EIR, prepared significant background materials, or participated substantially in preparing the EIR is presented below.

7.1 Del Puerto Canyon Reservoir Project Partner Agencies

7.1.1 Del Puerto Water District, CEQA Lead Agency

- Anthea G. Hansen, General Manager

7.1.2 San Joaquin River Exchange Contractors Water Authority

- Chris White, Executive Director

7.2 EIR Preparation Team

Table 7-1: List of Preparers

Name	Qualifications	Project Role
	Woodard & Curran	
Robin Cort	B.S. Biology, Ph.D. Ecology; over 35 years experience	Manager of EIR preparation
Andrew Neal	B.A. Business Administration, 12 years experience	Program Manager
Lyndel Melton	M.S. Environmental Engineering, B.S., Civil Engineering: Over 40 years experience	Principal In Charge and Technical Reviewer
Jennifer Ziv	B.S. Environmental Science, M.S. Water Resource Management; 25 years experience	EIR document coordinator
Xavier Irias	B.S., Civil Engineering; 33 years experience	Technical Reviewer
Michael Matson	B.S., Civil Engineering; 34 years experience	Development of project description
Sally Johnson	B.S. History, M.S. Environmental Science and Management, 8 years experience	Aesthetics
Katie Cole	M.S. Environmental Science and Management, B.S. Sociology and Environmental Studies; 6 years experience	Water Resources Planner
Matthew Jones	B.S. Atmospheric Science, MS. Marine and Atmospheric Science; 13 years experience	Air Quality Modeling
Haley Johnson	B.S. Environmental Science, 8 years experience	Air Quality, GHG
Micah Eggleton	B.S. Environmental Science, M.S. Environmental Science and Management; 4 years experience	Geology and Paleontology, Environmental Justice
Jennifer Kidson	B.S. Biology, M.S. Environmental Science,4 years experience	Land Use, Agriculture
Brian Wickes	B.S. Environmental Science, M.S. Environmental Science and Management, 7 years experience	Hydrology/Water Quality
Lindsay Martien	B.S. Marine Biology, M.S. Environmental Science and Management, 2 years experience	Public Services, Energy
Brian Van Lienden	B.S. Civil Engineering, M.S. Civil & Environmental Engineering; 21 years experience	Reservoir operations analysis
Nicole Poletto	B.S. Environmental Science, M.S. Environmental Science, Policy and Management; 3 years experience	Hazards/hazardous materials
Kelsey Bradley	B.S. Civil and Environmental Engineering; 6 years experience	GIS, mapping

Name	Qualifications	Project Role
	ICF	
Pablo Arroyave	B.S. Wildlife Ecology; 26 years experience	ICF project director of EIR
Nicole Williams	B.A. Environmental Analysis and Design and Criminology, Law, and Society, Master of Environmental Management (water resources); 13 years experience	ICF manager of EIR preparation/technical reviewer
John Howe	B.S. Biology, M.S. Environmental Biology; 23 years experience	Wildlife Resources Section
Rob Preston	B.A. Biological Sciences and Chemistry M.A. Botany PhD Botany; 24 years experience	Wetlands and Botany Resources Section
Arin Philips	B.S. Environmental Science and Management (minor in Wildlife, Fish, and Conservation Biology); 2 years experience	Wildlife Resources Section
Shannon Crossen	B.S. Biology, Biodiversity, Ecology, and Conservation Biology, M.S. Environmental Science; 10 years experience	Wildlife Corridors Section
William Mitchell	B.S. Biology, M.S. Fisheries Biology; 30 years experience	Fisheries Resources Section
Lesa Erecius	B.S. Physiology, M.S., Pharmacology and Toxicology (emphasis on Aquatic Toxicology); 13 years experience	Water Quality Section
Katrina Sukola	B.S. Environmental Chemistry, M.S. Chemistry; 15 years experience	Water Quality Section Technical Review
Stephen Pappas	B.A. Anthropology, M.A. Anthropology; 10 years experience	Archeological Cultural Resources Section
Amanda Reese	B.A. European History, M.A. Public History; architectural historian with 5 years experience	Built-Environment Cultural Resources Section
Christiaan Havelaar	B.A. Anthropology (minor in History); archaeologist with 20 years experience	Archeological Cultural Resources Section Technical Reviewer
David Lemon	B.A. U.S. History, M.A. Public History, Studies toward PhD, Public History; over 15 years of experience	Built-Environment Section Technical Reviewer
Barbara Wolf	B.A. Geography and Anthropology, M.A. Anthropology (minor in American Indian Studies); 8 years experience	Tribal Cultural Resources Section
Erin Gustafson	B.A. Urban Studies and Planning (minors in Environmental Studies and Economics); 7 years experience	Indian Trust Assets Section
Kasey Allen	BA, Economics (minor in Geography); 9 years experience	Lead GIS Analyst
Dan Schiff	B.A. Geography; 15 years experience	Wildlife GIS analyst
Dave Nicholson	B.A. Political Science and Anthropology, Master of Anthropology Candidate (MC), Anthropology; 20 years experience	Cultural Resources GIS analyst
	Fehr & Peers	
Ellen Poling	B.S. Aeronautical Engineering; 25 years experience	Transportation study
	Northwest Hydraulic Consultants	
Brady J. McDaniel	B.S. Civil Engineering, M.S. Civil and Environmental Engineering; 15 years experience	Dam breach analysis

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Solving the region's needs through local partnerships